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Route to:

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U.S.
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OF COMMERCE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 10, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,458,363 through 4,459,702
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 26, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,380,833	06/297,778	4/26/83
4,380,835	06/251,961	4/26/83
4,380,842	06/288,272	4/26/83
4,380,848	06/244,720	4/26/83
4,380,850	06/259,951	4/26/83
4,380,867	06/281,668	4/26/83
4,380,874	06/257,657	4/26/83
4,380,877	06/286,397	4/26/83
4,380,884	06/228,175	4/26/83
4,380,885	06/223,929	4/26/83
4,380,888	06/238,990	4/26/83
4,380,889	06/323,718	4/26/83
4,380,895	06/274,285	4/26/83
4,380,902	06/270,892	4/26/83
4,380,926	06/227,564	4/26/83
4,380,931	06/256,750	4/26/83
4,380,936	06/271,638	4/26/83
4,380,951	06/264,449	4/26/83
4,380,953	06/230,240	4/26/83
4,380,958	06/217,349	4/26/83
4,380,962	06/223,614	4/26/83
4,380,969	06/310,737	4/26/83
4,380,970	06/248,499	4/26/83
4,380,973	06/290,598	4/26/83
4,380,987	06/241,585	4/26/83
4,381,002	06/217,881	4/26/83
4,381,009	06/228,937	4/26/83
4,381,024	06/334,646	4/26/83
4,381,028	06/248,796	4/26/83
4,381,030	06/220,506	4/26/83
4,381,040	06/303,188	4/26/83
4,381,041	06/208,699	4/26/83
4,381,055	06/242,673	4/26/83
4,381,068	06/233,039	4/26/83
4,381,071	06/279,733	4/26/83
4,381,075	06/331,722	4/26/83
4,381,078	06/220,501	4/26/83
4,381,083	06/231,067	4/26/83
4,381,097	06/226,003	4/26/83
4,381,100	06/222,147	4/26/83
4,381,101	06/236,947	4/26/83
4,381,109	06/288,219	4/26/83
4,381,110	06/306,657	4/26/83
4,381,112	06/283,439	4/26/83
4,381,113	06/236,720	4/26/83
4,381,116	06/220,304	4/26/83
4,381,122	06/233,621	4/26/83
4,381,123	06/223,828	4/26/83
4,381,125	06/231,393	4/26/83
4,381,150	06/248,376	4/26/83
4,381,156	06/279,032	4/26/83
4,381,174	06/238,786	4/26/83
4,381,183	06/314,007	4/26/83
4,381,185	06/271,912	4/26/83
4,381,191	06/277,019	4/26/83
4,381,205	06/365,531	4/26/83
4,381,206	06/285,163	4/26/83
4,381,228	06/274,084	4/26/83
4,381,240	06/260,681	4/26/83
4,381,242	06/391,597	4/26/83
4,381,243	06/322,871	4/26/83
4,381,266	06/219,201	4/26/83
4,381,281	06/215,161	4/26/83
4,381,285	06/223,755	4/26/83
4,381,287	06/363,367	4/26/83
4,381,298	06/310,390	4/26/83
4,381,304	06/295,179	4/26/83
4,381,310	06/295,276	4/26/83
4,381,317	06/297,620	4/26/83
4,381,367	06/328,009	4/26/83
4,381,370	06/246,102	4/26/83
4,381,374	06/320,983	4/26/83
4,381,412	06/289,854	4/26/83
4,381,413	06/288,501	4/26/83
4,381,422	06/280,670	4/26/83
4,381,423	06/249,703	4/26/83
4,381,425	06/231,430	4/26/83
4,381,428	06/262,362	4/26/83
4,381,434	06/217,605	4/26/83
4,381,435	06/222,183	4/26/83
4,381,440	06/228,511	4/26/83
4,381,442	06/277,027	4/26/83
4,381,443	06/322,084	4/26/83
4,381,448	06/297,795	4/26/83
4,381,457	06/286,278	4/26/83
4,381,466	06/244,080	4/26/83
4,381,486	06/237,846	4/26/83
4,381,501	06/248,820	4/26/83
4,381,504	06/229,942	4/26/83

Patent Number	Serial Number	Issue Date
4,381,509	06/237,020	4/26/83
4,381,511	06/259,053	4/26/83
4,381,537	06/337,074	4/26/83
4,381,558	06/267,037	4/26/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,394,569, Re. S.N. 050,275, Filed May 13, 1987, Cl. 250/204, FOCUS DETECTING METHOD AND APPARATUS, Kazuo Nakamura, Owner of Record: *Asahi Kogaku, Tokyo, Japan,* Attorney or Agent: John H. Mion, et al., Ex. Gp.: 255

4,518,860, Re. S.N. 053,091, Filed May 20, 1987, Cl. 250/253, COMPACT DETECTOR FOR RADON AND RADON DAUGHTER PRODUCTS, H. Ward Alter, et al., Owner of Record: *Terradex Corp., Walnut Creek, Calif.,* Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 256

4,525,417, Re. S.N. 051,989, Filed May 19, 1987, Cl. 428/244, CARBON CONTAINING SLIDING LAYER, Heinz Dimigen, et al., Owner of Record: *U.S. Philips Corp., New York, N.Y.,* Attorney or Agent: Thomas A. Briody, et al., Ex. Gp.: 154

4,615,895, Re. S.N. 053,129, Filed May 22, 1987, Cl. 426/523, FORCED AIR/GAS BURNER AND BAKING OVEN INCORPORATING SAME, Amal C. Bhattacharjee, Owner of Record: *Nabisco Brand, Inc., Parsippany, N.J.,* Attorney or Agent: Richard Kornutik, Ex. Gp.: 132

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Patent Term Extended Under 35 USC 156

A certificate extending the term of the following patent was issued on June 19, 1987.

Patent No. 4,243,775, granted Jan. 6, 1981, to Rosensaft, et al., Owner of Record: American Cyanamid Co., Title: SYNTHETIC POLYESTER SURGICAL ARTICLES, Classification: 525–415, Term Extended: 2 years

Patent and Trademark Office
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO–87–A6–chemical technology, PTO–87–A7–electrical technology, and PTO–87–A8–mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF–171;
(2) Merit Program Interest Statement, CD–261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD–362 (letters of reference for outside candidates);
(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557–3631.

Feb. 3, 1987.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner or Patents and Trademarks.

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103–7058]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98–622.
Effective Date: May 27, 1987.
For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557–4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

> Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294–2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9–10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756–32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25–31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552–558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

Discussion of the Rule

Under §1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revise and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

> • • • stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with §1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard* v. *Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.

(2) The issues to be decided by the arbitrator.

(3) A provisions that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

(1) The style (e.g., *Jones* v. *Smith*), the number of the interference and the names of the real parties in interest.

(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.

(3) The issues for decision before the arbitrator.

(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.

(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

(a) Where the award was procured by corruption, fraud, or undue means.

(b) Where there was evident partiality or corruption in the arbitrators, or either of them.

(c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any part have been prejudiced.

(d) Where the arbitrators exceeded their powers, or so imperfectly execute them that a mutual, final, and definite award upon the subject matter submitted was not made.

(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—

(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.

(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.

(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc.* v. *Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

Example 1

Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37

CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with §1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice—Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under §1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with § 1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to extablish vis-a-vis the public that the subject matter of the court is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examinter-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice—Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct * * * in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of §1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with §1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616.

Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey* v. *Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Discussion of Comments

One commentor suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed §1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentor suggested, by telephone, that a provision be added to proposed §1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentor stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of §1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98–622.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New §1.690 is added to Subpart E to read as follows:

§1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thrity (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

DONALD J. QUIGG,
Mar. 16, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

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BILLING CODE 3510-16-M

Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Apr. 7, 1987 were mailed to 89 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Aug. 10, 1987.

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Sharkey, Richard G., 2505 N.E. 137th St., Seattle, Wash. 98125
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Sidor, Karl V., 714-G N. Sanders St., Ridgecrest, Calif. 93555
Small, Jonathan A., 2208 Broderick St., San Francisco, Calif. 94115
Sorrentino, Joseph M., 6101 Edsall Rd., Apt. 501, Alexandria, Va. 22304
Stephens, Lawrence K., 12536 Arnsley Ct., Herndon, Va. 22071
Tan, Steven Wheeler, 160 Bent Tree Dr., #3A, Fairfield, Ohio 45014
Thomas, Dirk D., 2630 East-West Hwy., Chevy Chase, Md. 20815
Tribble, Jack L., 110 Edgemont Rd., Montclair, N.J. 07043
Trzyna, Peter K., Cadwalader, Wickersham & Taft, 1333 N. Hampshire Ave., N.W., Washington, D.C. 20036
Walker, Paul M., Jr., 600 Haverford Rd., Ridley Park, Pa. 19078
White, John M., 3153-B Anchorway Ct., Falls Church, Va. 22042
Whitham, Michael E., 10858 Monticello Ct., Great Falls, Va. 22066
Wieghaus, Brian J., 20 Gilbert Ave., Paramus, N.J. 07652
Wilson, Casey F., 2203-A 25th Ave. S., Nashville, Tenn. 37212
Winter, Daryl B., 2145 Dexter Ave. N., #106, Seattle, Wash. 98109
Wolin, Harry A., 2740 N. Tomahawk, Tucson, Ariz. 85749

June 16, 1987.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Aug. 10, 1987.

Brown, Theresa A., 3180 S. Albion St., Denver, Colo. 80222
Chapman, Terryence F., 3439 Fawn Cove, #5, Portage, Mich. 49002
Ciarlante, Anthony V., 4310 Brinkley Rd., Temple Hills, Md. 10748
Heaney, Brion P., 3329 Ardley Ct., Falls Church, Va. 22041
Hirama, Tokuo, Smart & Biggar, P.O. Box 2999, Sta. D., Ottawa, Ont., Canada K1P 5Y6
Ladd, Thomas A., 1804 17th Ave., Menominee, Mich. 49858
Malech, Pamela H., 4115 Davis Pl., N.W., #105, Washington, D.C. 20007
McFarland, James D., 3485-C Reynard Way, San Diego, Calif. 92103
Meyer, Dena, 1303 N. Scott St., Wilmington, Del. 19806
Meyer, Richard S., 815 S. 18th St., #607, Arlington, Va. 22202
Montes, Raul R., 12035 Arrowhead Glen, Houston, Tex. 77071
Muccino, Richard R., RD 3, Box 539, Ringoes, N.J. 08551
Murray, Michael M., 7436 Chummley Ct., Falls Church, Va. 22043
Schad, Steven P., 2436 King Bridge Terr., Kentwood, Mich. 49506
Smith, Randolph A., 4916 Rock Spring Rd., Arlington, Va. 22207
Tucker, Albert M., 2729 Erlene Ave., #1070, Cincinnati, Ohio 45238

June 16, 1987.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Counsel Patent and Legal Operation, Corporate Research and Development, General Electric Co., P.O. Box 8, Bldg. K-1, Rm. 4A70, Schenectady, N.Y. 12301.

4,619,904. AGGLUTINATING IMMUNOASSAY USING PROTEIN-COATED LIQUID DROPLETS.
4,664,808. METHOD FOR CONTINUOUS SEPARATION OF DISSOLVED MATERIALS.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, AP2-226, Louisville, Ky. 402253.

3,824,805. COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER SELECTOR MEANS.
3,942,265. DRYER CONTROL ARRANGEMENT.
4,329,630. SINGLE TRANSISTOR POWER CONTROL CIRCUIT FOR A DC MOTOR WASHING MACHINE DRIVE.
4,330,924. METHOD OF FORMING CRIMPED TUBE JOINT.
4,333,322. MOUNT FOR WASHING MACHINE.
4,358,932. CONTROL SYSTEM FOR REFRIGERATOR WITH THROUGH-THE-DOOR QUICK-CHILLING SERVICE.
4,409,532. START CONTROL ARRANGEMENT FOR SPLIT PHASE INDUCTION MOTOR.
4,439,995. AN AIR CONDITIONING HEAT PUMP SYSTEM HAVING AN INITIAL FROST MONITORING CONTROL MEANS.
4,445,344. REVERSIBLE ROTARY COMPRESSOR.
4,592,785. PORTEINACEOUS SOIL REMOVAL PROCESS.

4,594,481. ELECTRIC TOUCH PAD KEY ASSEMBLY WITH STROKE AMPLIFIER.
4,595,855. SYNCHRONOUSLY OPERABLE ELECTRICAL CURRENT SWITCHING APPARATUS.
4,604,715. ROBOTIC INSPECTION SYSTEM.
4,620,078. POWER CONTROL CIRCUIT FOR MAGNETRON.

241,743. COMBINED PENCIL SHARPENER AND CLIP, *Mark Lemieux*, 131 Wilding Ave., Sault Ste. Marie, Ontario, Canada P6A-4V2; (705) 949-1802.
3,717,195. AUTOMATIC METAL LOUVERED SAFETY BLIND, *Gaston A. Larranaga*, Lokmaster Security System, 18761 W. North Frederick Ave., Gaithersburg, Md. 20879; (301) 963-4440.
3,878,539. PORTABLE ALARM DEVICE FOR HOME, OFFICE AND TRAVEL. ADJUSTABLE SLIDE-BRACKET HOOKS OVER DOOR TOPS IN SECONDS, *Chadyeane Gooding*, 3100-A Spring Hill Rd., Smyra, Ga. 30080.
4,276,474. METHOD AND APPARATUS FOR CONTROLLING CURRENT IN INDUCTIVE LOADS, *C. Riverds*, P.O. Box 4757, Woodbridge, Va. 22194.
4,584,789. APPARATUS FOR ENHANCING THE DEVELOPMENT OF MICROORGANISMS NEEDED TO PROMOTE THE GROWTH AND DEVELOPMENT OF VEGETATION, *Gilbert and Maurice Jean*, c/o Neil F. Greenblum, Esq., Sandler & Greenblum, 2920 S. Glebe Rd., Arlington, Va. 22206; (703) 739-0333.
4,633,853. HOT WATER TANK CHECK VALVE, *Leonard Prill*, 28522 Hillview, Roseville, Mich. 48066.
4,649,676. SHELTER CONSTRUCTION, *C. Regina Dawey*, c/o Frederick L. Bergert, Law Offices, Nies, Webner, Kurz & Bergert, Suite 700, 1911 Jefferson Davis Hwy., Arlington, Va. 22202
4,662,549. CHILD'S BACKPACK, *Pat M. Dean*, 103 Springfield Pl., Goose Creek, S.C. 29445; (803) 572-7588

S.N. 690,888. ROTARY INTERNAL COMBUSTION ENGINE, *Joseph F. Frasca*, 5801 Yorktown Rd., Lorain, Ohio 44053.

PATENT NOTICES

Certificates of Correction for the Week of July 14, 1987

D. 288,242	4,618,370	4,636,814	4,648,699
D. 288,977	4,619,935	4,636,824	4,649,080
D. 288,978	4,620,636	4,636,877	4,649,342
4,416,762	4,621,287	4,636,942	4,650,280
4,435,307	4,622,214	4,637,204	4,650,576
4,446,226	4,625,704	4,637,850	4,651,256
4,462,089	4,626,535	4,638,444	4,651,577
4,482,784	4,626,570	4,639,036	4,651,890
4,493,983	4,626,923	4,639,746	4,652,049
4,504,610	4,627,049	4,640,438	4,652,149
4,505,778	4,627,219	4,640,600	4,652,199
4,554,945	4,628,402	4,640,669	4,652,403
4,573,994	4,628,916	4,640,774	4,652,953
4,578,293	4,628,970	4,640,776	4,653,111
4,583,605	4,629,228	4,640,798	4,653,156
4,584,361	4,630,039	4,640,960	4,653,431
4,585,211	4,630,343	4,641,174	4,654,008
4,588,433	4,631,379	4,641,229	4,654,391
4,588,876	4,632,500	4,641,386	4,654,839
4,589,468	4,632,517	4,641,644	4,655,587
4,591,632	4,632,932	4,641,980	4,655,973
4,593,016	4,633,274	4,642,311	4,656,111
4,593,891	4,633,861	4,642,673	4,656,718
4,595,956	4,634,220	4,643,048	4,656,861
4,606,408	4,634,350	4,643,068	4,657,262
4,610,385	4,634,713	4,643,849	4,657,727
4,611,079	4,634,855	4,644,072	4,659,452
4,613,385	4,635,928	4,644,532	4,659,503
4,614,156	4,636,253	4,644,965	4,659,580
4,615,100	4,636,410	4,645,004	4,659,936
4,615,631	4,636,510	4,647,194	4,660,913
4,616,011	4,636,805	4,647,358	4,661,108
4,616,976	4,636,806	4,647,665	4,663,046

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 23, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-15-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-08-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-07-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-22-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-07-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during May 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,599,579 to 3,514,783, inclusive

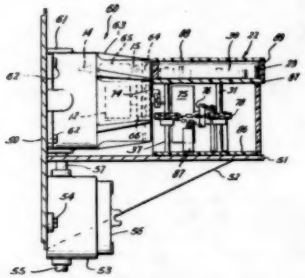
Plant Patents ..... None

REEXAMINATIONS

JULY 14, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,464,799 (721st)
GAS DETECTOR
Charles L. Kimbell, P.O. Box 19035, Houston, Tex. 77055
Reexamination Request No. 90/000,043, Aug. 3, 1981.
Reexamination Certificate for Patent No. 3,464,799, issued Sep. 2, 1969, Ser. No. 463,678, Jun. 14, 1965.
Int. Cl.[4] G01N *21/76*
U.S. Cl. 422—91



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7** and **8** is confirmed.

Claims **3**, **5** and **6** are now disclaimed.

Claims **1**, **2** and **4** were not reexamined.

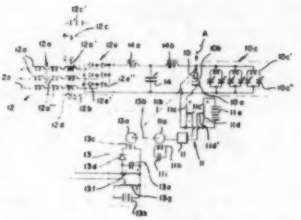
7. The detector set forth in claim **3**, wherein:
(a) said indicator is a strip; and
(b) said means for exposing said indicator strip includes a sealed container for housing said indicator strip and sealing it from the atmosphere except at a slotted portion through which the strip is successively fed externally of the sealed container for exposing to the gas the portion only of said strip moving across said slotted portion of said housing.

B1 3,536,881 (722nd)
CONSTANT CURRENT DENSITY EDM SYSTEM CAPABLE OF AUTOMATICALLY RESPONDING TO CHANGING MACHINING AREA
Kiyoshi Inoue, Tokyo, Japan, assignor to IJR Inc., Yokohama, Japan
Reexamination Request No. 90/001,001, May 1, 1986.
Reexamination Certificate for Patent No. 3,536,881, issued Oct. 27, 1970, Ser. No. 762,580, Sep. 25, 1968.
Continuation-in-part of Ser. No. 682,824, Nov. 14, 1967, which is a continuation-in-part of Ser. No. 493,473, Oct. 6, 1965, Pat. No. 3,360,683.
Claims priority, application Japan, Oct. 21, 1967, 42-67723; Nov. 27, 1967, 42-76040
Int. Cl.[4] B23P *1/04, 1/08*
U.S. Cl. 219—69 G

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

1. In a method of machining a workpiece constituting a workpiece electrode by advancing a tool electrode with respect to the workpiece electrode and maintaining a machining gap therebetween flooded with a dielectric coolant, by applying electric pulses across the electrodes to effect electroerosive spark discharge along the workpiece surface juxtaposed with the tool electrode, whereby the surface area over which machining occurs varies during the process, the improvement which comprises the steps of continuously deriving an electrical signal in response to the maintenance of said gap and representing variation in the surface area over which machining occurs; and automatically controlling the mean electric current supplied to said electrodes in the course of advance of said tool electrode to maintain the current density along said machining surface substantially constant while the area of the machining surface juxtaposed with the tool electrode is varied.



B1 4,062,981 (723rd)
HUMIDIFYING AND SHIRRING ARTIFICIAL SAUSAGE CASING
Douglas J. Bridgeford, Champaign, Ill., assignor to Teepak Investments, Inc., Chicago, Ill.
Reexamination Request Nos. 90/000,983, Apr. 9, 1986 and 90/001,070, Aug. 18, 1986.
Reexamination Certificate for Patent No. 4,062,981, issued Dec. 13, 1977, Ser. No. 662,669, Mar. 1, 1976.
Continuation-in-part of Ser. No. 488,646, Jul. 15, 1974, abandoned.
Int. Cl.[4] A22C *13/02;* **A23L** *1/31*
U.S. Cl. 426—278

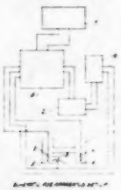
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **4** and **5** are determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

1. In a process for humidifying an artificial sausage casing on a shirring machine wherein a moisture-providing fluid is contacted with the inside wall of unshirred casing and the casing subsequently shirred, the improvement which comprises employing as said moisture-providing fluid a mixture comprising water and from about 0.5–5% of a *water-dispersible* surfactant having lubricating properties which is applied to said casing in a proportion to provide from about 0.015 to 0.15 mg. surfactant per square inch of casing.

B1 4,146,437 (724th)
METHOD FOR EVALUATING A SYSTEM FOR ELECTRODEPOSITION OF METALS
Thomas J. O'Keefe, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.
Reexamination Request No. 90/000,671, Nov. 23, 1984.
Reexamination Certificate for Patent No. 4,146,437, issued Mar. 27, 1979, Ser. No. 831,811, Sep. 9, 1977.
Continuation of Ser. No. 645,609, Dec. 31, 1975, abandoned.
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2–20** are cancelled.

Claim **1** is determined to be patentable as amended.

1. A method for evaluating an unknown electrolytic system comprising an acidic electrolytic solution and electrodes for electrodeposition of metals with respect to determining the performance characteristics of **[**the electrolytic solution, detection of impurities or additives in the electrolytic solution, estimation of the current efficiency characteristics of said system, or determining the performance characteristics of**]** an *unknown working* electrode, the method comprising the steps of:

establishing an electrolytic circuit comprising a sample of the acidic electrolytic solution for said system, two electrodes immersed in said solution and spaced from one another therein, and a variable and reversible voltage source having its output terminals respectively connected to said electrodes;

applying a predetermined initial voltage to one of said electrodes constituting **[**a**]** *an unknown* working electrode;

varying the voltage in the negative direction until a predetermined cathodic current or predetermined maximum voltage sufficient to cause a cathodic reaction is attained at said working electrode thereby causing reduction of metal ions and deposition of metal at said electrode;

reversing the direction of change of voltage and varying the voltage in the positive direction until a predetermined minimum voltage or a predetermined minimum current is attained at said working electrode thereby causing oxidation and redissolution of the metal which had been deposited by said cathodic reaction;

repetitively varying the voltage in the negative direction, reversing it, and varying it in the positive direction through a plurality of cycles until a pseudoequilibrium is reached;

recording the current obtained as a function of voltage for a cycle representative of the pseudoequilibrium, and

determining the **[**performance characteristics of the sample solution, the presence of an impurity or additive, the current efficiency, or the**]** working electrode characteristics according to the recorded relationship between current and voltage at pseudoequilibrium *by comparing the current versus voltage function for the unknown system with the current versus voltage functions for known systems having the same electrolytic solution as the unknown system.*

B1 4,200,703 (725th)
PROCESS FOR THE MANUFACTURE OF HEAT-STABLE, NUCLEAR-BROMINATED POLYSTYRENES
Klaus Diebel; Horst-Dieter Wulf; Raban Grundmann, and Gunther Maahs, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Marl, Fed. Rep. of Germany
Reexamination Request No. 90/001,036, Jun. 20, 1986.
Reexamination Certificate for Patent No. 4,200,703, issued Apr. 29, 1980, Ser. No. 617, Jan. 2, 1979.
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800012; Jan. 2, 1978, 2800013
Int. Cl.[4] C08F *8/20, 8/22*
U.S. Cl. 525—340

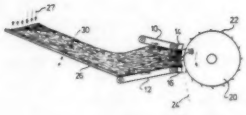
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

New claims **8–18** are added and determined to be patentable.

1. A process for the manufacture of a heatstable, nuclear-brominated polystyrene comprising brominating, at −20° C. to +40° C., a polystyrene dissolved in a chlorinated hydrocarbon in the presence of a Lewis acid catalyst, and 0.02 to 2 moles, per mole of Lewis acid, of a nucleophilic substance which acts as a Lewis base for the Lewis acid, the amount of Lewis base being selected within this range such that the polystyrene is essentially not crosslinked during bromination.

B1 4,369,797 (726th)
FEED MECHANISM FOR TOBACCO CUTTING MACHINES
Warren A. Brackmann, Cooksville, and Stanislav M. Snaidr, Mississauga, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada
Reexamination Request No. 90/000,433, Aug. 12, 1983.
Reexamination Certificate for Patent No. 4,369,797, issued Jan. 25, 1983, Ser. No. 215,006, Dec. 10, 1980.
Claims priority, application United Kingdom, Dec. 12, 1979, 7942887
Int. Cl.[4] A24B *7/04*
U.S. Cl. 131—109.3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 4–7** and **11** are determined to be patentable as amended.

Claims **3** and **8–10**, dependent on an amended claim, are determined to be patentable.

New claims **12–23** are added and determined to be patentable.

1. A method of supplying tobacco is threshed tobacco lamina or whole leaf form to a cutting station *in which cutting*

station [wherein] the tobacco is forwarded *substantially* horizontally *from an upstream end thereof* and is comminuted *at a downstream end thereof* at the rate at which *the tobacco* [it] enters the station, which comprises:

forming a relatively thin layer of tobacco on [a] *an elongate* conveying surface *at a location remote from said cutting station,* [in which] the tobacco *in said layer being* [is] oriented substantially planarly of the layer and [is] substantially evenly distributed across the width thereof,

subjecting said thin layer *on said conveying surface* to vibration whereby the tobacco in said layer densifies without the use of any force other than gravity *while simultaneously*[,] conveying said thin layer *on said conveying surface* towards said cutting station *without substantially altering the orientation and juxtaposition of said tobacco in said layer,*

interleaving said tobacco in said thin layer with longitudinally-adjacent tobacco *substantially* without altering the orientation of the leaves in the said thin layer to form a relatively thick layer of interwoven compacted tobacco in which the tobacco is oriented planarly of the relatively-thick layer and containing the quantity of tobacco desired to be fed to said cutting station, and

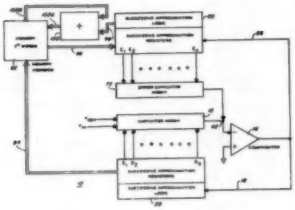
feeding said relatively thick layer to said cutting station without substantially altering the orientation of the tobacco in said layer.

B1 4,399,426 (727th)

ON BOARD SELF-CALIBRATION OF ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTERS

Khen-Sang Tan, Plano, Tex., assignor to Texas Instruments, Inc., Dallas, Tex.

Reexamination Request No. 90/001,019, May 30, 1986.
Reexamination Certificate for Patent No. 4,399,426, issued Aug. 16, 1983, Ser. No. 260,435, May 4, 1981.
Int. Cl.[4] H03M *1/10*
U.S. Cl. 340—347 CC



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **2** is cancelled.

Claims **1**, **4** and **11** are determined to be patentable as amended.

Claims **3** and **5–10**, dependent on an amended claim, are determined to be patentable.

New claim **12** is added and determined to be patentable.

1. A self-calibrating charge-redistribution analog-to-digital converter comprising:

a first binary weighted capacitor array having a plurality of capacitors, one plate of each of said capacitors being electrically connected to a node,

a comparator having one input electrically connected to said node,

first logic means connected to said comparator output and said array for selectively connecting said capacitors to preselected voltages, [and]

at least one second binary weighted error capacitor array electrically connected to said node and having a plurality of capacitors for determining the error correcting signal required at said node to correct the binary mismatch of preselected capacitors in said first array, each of said capacitors in said error capacitor array [being] *having one plate* connected through a scaling capacitor to said node *and an other plate connected to a reference potential*[.], *and*

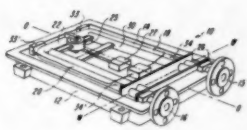
second logic means connected to said comparator output for selecting said capacitors in said second binary array to provide said error correcting signal.

B1 4,422,338 (728th)

METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Reexamination Request Nos. 90/001,103, Oct. 1, 1986 and 90/001,115, Oct. 14, 1986 and 90/001,149, Jan. 13, 1987.
Reexamination Certificate for Patent No. 4,422,338, issued Dec. 27, 1983, Ser. No. 280,297, Jul. 6, 1981.
Continuation-in-part of Ser. No. 235,268, Feb. 17, 1981, abandoned.
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–27** is confirmed.

1. In a Coriolis force mass flow rate meter including at least one continuous curved conduit solidly mounted at the open ends of leg portions thereof, which conduit is adapted to oscillate about an axis passing substantially through the mounting points of the legs, and further including mass flow rate readout means adapted to indicate mass flow rate as a function of the time delays in each direction of oscillation between the passage of one side leg of the curved conduit through a predetermined point of its oscillation and the passage of the other side leg of said conduit through a corresponding predetermined point of its oscillation, the improvement which comprises:

at least one pair of sensors, one member of each pair being mounted on opposite side legs of the conduit, the sensors being adapted to generate an analog signal linearly representative of the actual oscillatory movement of the sides of the curved conduit at the location of the respective sensor; and

means to electronically detect the time delay between the analog sensor signals corresponding to the time difference in the passage of the opposite sides of the curved conduit through points near the mid-plane of oscillation;

whereby the magnitude of the time delay between the sensor outputs representing the time difference in passage through the mid-plane of oscillation is a measure of the mass flow rate through the curved conduit.

REISSUES

JULY 14, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,458

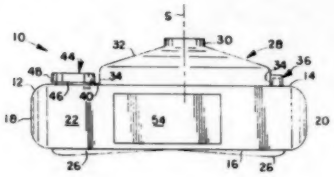
PORTABLE CONTAINER WITH INTERLOCKING FUNNEL

Victor A. DeLay, Jr., 11886 70th St. No., Largo, Fla. 33543, assignor to Carl von dem Bussche; Victor A. DeLay, Jr. and Patrick T. Maguire, all of Pinellas County, Fla.

Original No. 4,557,395, dated Dec. 10, 1985, Ser. No. 717,439, Mar. 28, 1985. Application for reissue May 5, 1986, Ser. No. 859,507

Int. Cl. B65D *3/04*

U.S. Cl. 220—86 R **20 Claims**



1. A container of the type having a small fill spout and having increased utility when used in conjunction with a funnel, comprising:

a container body member [of generally parallelepiped configuration],

a fill spout formed in a top wall of said container body member and projecting upwardly therefrom,

a vent means in the form of an aperture formed in said top wall,

a funnel member having a rim, converging sidewalls, and a downspout,

said fill spout and funnel downspout adapted for [releasable engagement] *operative association* with one another,

a vent closure member secured to said funnel rim and projecting outwardly therefrom,

said vent closure member closing said vent when brought into registration therewith.

Re. 32,459

VISCOSITY MODIFIERS FOR ACRYLAMIDE POLYMERS

Donald N. Van Eenam, Des Peres, Mo., assignor to Akzo N.V., Arnhem, Netherlands

Original No. 4,433,090, dated Feb. 21, 1984, Ser. No. 502,830, Jun. 9, 1983. Continuation of Ser. No. 648,842, Sep. 6, 1984, abandoned. Application for reissue Aug. 5, 1985, Ser. No. 763,310

Int. Cl.[4] C08F *2/38*

U.S. Cl. 524—295 **11 Claims**

1. An acrylamide polymer comprising acrylamide and a sufficient amount of cinnamic acid *material selected from the group consisting of cinnamic acids, cinnamyl alcohols, salts of cinnamic acids, and cinnamyl amines* to substantially reduce the viscosity of the acrylamide polymer in solution.

PATENTS

GRANTED JUL. 14, 1987

ERRATA

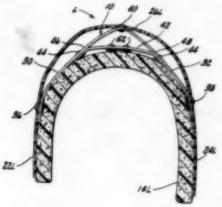
For CLASS	See PATENT NO.
110-346	4,679,268
439-495	4,679,868
439-078	4,679,869
439-493	4,679,870
439-070	4,679,871
439-061	4,679,872
439-134	4,679,873
439-595	4,679,874
439-604	4,679,875
439-426	4,679,876
439-425	4,679,877
439-425	4,679,878
439-429	4,679,879
439-404	4,679,880
439-392	4,679,881
439-569	4,679,882
439-607	4,679,883
439-106	4,679,884
439-620	4,679,885
439-816	4,679,886
439-849	4,679,887
439-883	4,679,888
439-876	4,679,889
439-884	4,679,890
474-153	4,679,999
493-159	4,680,016
425-301	4,680,269
503-214	4,680,597
503-217	4,680,598

PATENTS

GRANTED JULY 14, 1987

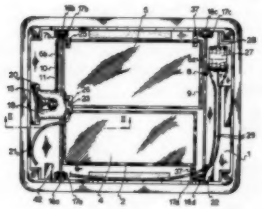
GENERAL AND MECHANICAL

4,679,253
SHOULDER PAD TRUSS ARCH SYSTEM
Hal D. Mitchell, and Donald R. Walker, both of Rolla, Mo., assignors to Figgie International Inc., Willoughby, Ohio
Filed Aug. 18, 1986, Ser. No. 897,082
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **14 Claims**



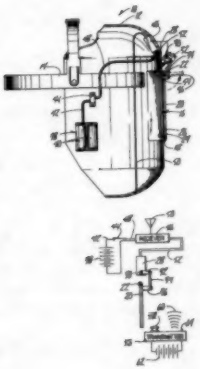
1. A shoulder pad truss arch system for a shoulder pad having a arch member adapted to fit over a shoulder of a wearer, the arch member being of generally inverted U-shape as viewed from the side and having chestplate and backplate portions interconnected by a curved shoulder portion, the shoulder pad truss arch system comprising a first truss extending up from the chestplate portion of the arch member to the shoulder portion of the arch member, a second truss extending up from the backplate portion of the arch member to the shoulder portion of the arch member, and a truss bridge extending between the first and second trusses at a location spaced below the shoulder portion of the arch member, said truss bridge having one end attached to the first truss and the other end attached to the second truss so as to suspend the truss system and thus the shoulder pad on the shoulder of the wearer such that impact on the shoulder portion of the arch member causes the shoulder of the wearer to force at least a portion of the truss arch system generally upwardly to pull the chestplate and backplate portions toward one another.

4,679,254
PROTECTIVE SHIELD FOR A WELDERS MASK
Hendrikus P. Wiegel, Karel Doormanstraat 6, 2631 AM Nootdorp, Netherlands
Filed Jan. 17, 1986, Ser. No. 819,680
Claims priority, application Netherlands, Jan. 18, 1985, 8500129; Nov. 29, 1985, 8503315
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—8 **16 Claims**



1. A shield for protecting eyes, comprising:
a body having an opening;
an eye-protecting screen, slidable between first and second positions in which the screen covers and uncovers the opening;
a plurality of guide means in the shield for guiding the screen between the first and second positions, extending substantially parallel to the direction of screen movement;
a reversible electric motor secured to the body, comprising a drive shaft and a toothed or friction pinion secured to the drive shaft, for moving said screen between the firsr and second positions, said screen comprising a toothed or friction rack in direct contact with the pinion; and
means for activating the motor to move the screen between the first and second positions.

4,679,255
WELDER'S MASK WITH REMOTE CONTROLLED EYE SHIELD
Thomas E. Kuhlman, R. R. 7748, Spirit Lake, Iowa 51360
Filed Mar. 6, 1986, Ser. No. 837,030
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—8 **8 Claims**



1. A welder's mask having a remote controlled eye shield comprising:
a mask housing having a viewing opening and means for mounting the mask housing upon the head of a user;
a welder's eye shield having an upper edge portion hingedably secured to the mask housing and being hingeably movable between a closed position covering the viewing opening and an open position uncovering the viewing opening in the mask housing;
motor means having a drive shaft and being mounted on the mask housing and being operably connectable to a first battery power source mounted on the mask housing, the motor means having connecting linkage means attached between the eye shield and the motor means, the drive shaft of the motor means being operable in first and second directions to move the connecting linkage means to correspondingly move the eye shield to any resting position between and including the open and the closed positions;
the connecting means comprising a first arm rigidly secured at a first end to the drive shaft of the motor means, a second arm rigidly secured at a first end to and extending from the eye shield, and a linkage arm hingeably secured between the second ends of the first and second arms;
remote control radio signal transmitter means operably connectable to a second battery power source and having

control switch means for transmitting a radio signal corresponding to moving the eye shield between the opened position and the closed position; and

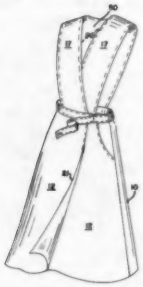
radio signal receiving means operably connectable to the first battery power means and the motor means for receiving and transferring the radio signal to the motor means.

4,679,256

MULTI-SIZE JUMPER DRESS

Marcia Hischke, Chicago, Ill., assignor to Uniforms To You & Company, Chicago, Ill.

Filed Oct. 23, 1986, Ser. No. 922,455
Int. Cl.[4] A41D *1/22*
U.S. Cl. 2—105 **3 Claims**



1. A wrap-around jumper dress adapted to fit a plurality of different female figures having height, waist, bust and hip measurements varying within predetermined ranges of these measurements between small and large, and comprising, in combination:

a skirt, a wearer's back panel, a pair of chest panels, and a waistband;

said skirt being formed by a middle panel and a pair of side panels joined at one side edge of each to opposite edges of said middle panel, said middle panel covering a wearer's rear side below the waist and at least a portion of the opposite sides of a wearer below the waist, and the unattached side portions of said side panels being adapted to overlap each other and at least cover the wearer's front side below the waist;

said wearer's back panel having a generally horizontal bottom edge and a pair of spaced shoulder edges interconnected by a back of-the-neck edge;

each of said chest panels having an upper edge joined to one of said back panel's shoulder edges and a lower edge which extends down to adjacent the top edge of the adjacent side panel;

said waistband being joined to the upper edges of said middle and side panels and to the bottom edge of said wearer's back panel and said lower edges of said chest panels, and said waistband having tab-like extensions on its opposite ends adapted to extend to behind a wearer's back side and be releasably secured to the back of the dress at the waist; and

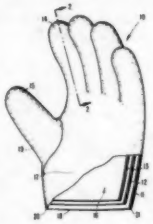
the act of drawing of said tab-like extensions snugly toward each other causing said dress to adjust itself to the shape, size and form of said wearer in respect to the wearer's particular height, waist, bust and hip measurements.

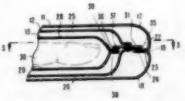
4,679,257

WATERPROOF GLOVE

Allen W. Town, 415 W. John St., Alexandria, Ind. 46001

Filed Jun. 23, 1986, Ser. No. 877,459
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—164 **25 Claims**





1. A covering for the hand comprising:

an outer shell closed on all sides except one which has an opening through which the hand may extend into said shell;

a membrane of material and being positioned within said outer shell and closed on all sides except one which is opened and aligned with said opening to allow the hand to extend into said membrane; and,

attachment means including an attachment tab sealingly secured to said membrane and extending outwardly therefrom to said outer shell whereat it is attached being operable to attach said membrane to said outer shell.

4,679,258

HYDROTHERAPY MASSAGE METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 796,987, Nov. 12, 1985. This application Mar. 24, 1986, Ser. No. 843,151
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **39 Claims**

1. Hydrotherapy apparatus for discharging a fluid stream substantially in a first direction for impacting against a user's body, said apparatus comprising:

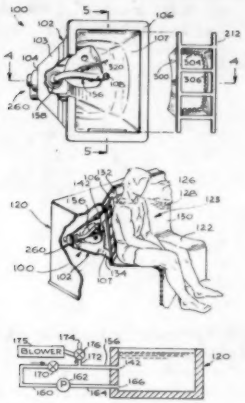
fluid supply means;

elongated conduit means having a first end including a supply orifice and a second end including a nozzle having a discharge orifice;

means mounting said conduit means first end for coupling said supply orifice to said fluid supply means for supply fluid to said discharge orifice, said mounting means permitting said nozzle to randomly traverse a substantially planar area spaced from said first end;

said discharge orifice being oriented to discharge a first fluid

stream component in a direction extending along said conduit means elongation in said first direction; and



means applying a transverse thrust force to said nozzle for moving said nozzle across said area.

4,679,259

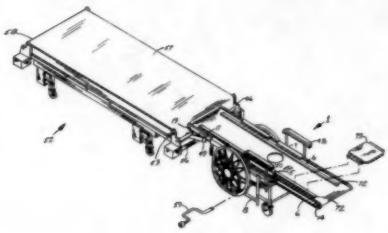
RECLINABLE WHEELCHAIR APPARATUS

Paul DiMatteo, Huntington, and Charles F. Chubb, Brookville, both of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Jul. 1, 1985, Ser. No. 750,913

Int. Cl.[4] A61G *7/08*

U.S. Cl. 5—81 R **31 Claims**



1. A reclinable wheelchair comprising: a back rest section, a seat section, and a leg rest section; conversion means for converting the wheelchair surface between an upright chair position and a reclined wheelchair position having an extended horizontal surface; means for positioning said wheelchair in said reclined position end-to-end with a support on which a person lies; said wheelchair having a continuous belt of flexible material passing over rollers near head and foot ends of said wheelchair; said belt comprising top and bottom surfaces of said wheelchair; constraining means for supporting said belt in a selected position on the wheelchair; rotational means for propelling said belt in either direction; propelling power means for driving said rotational means; a roller at the head end of said wheelchair and comprising two flanged rollers, one flanged roller being located on each side of the wheelchair; a shaft for mounting each flanged roller, each flanged roller being rotatable freely on said shaft within a cylindrical cavity, said cavity and flanged roller forming together a guidance groove having a narrow outer slit and a wider inner groove, said guidance groove being shaped so that a belt with thickened edges passes around the roller with a thickened edge of said belt passing through said wider inner groove, said belt having a relatively thinner center portion passing through said narrow outer slit.

4,679,260

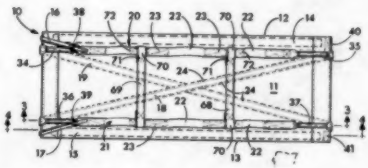
FLEXIBLE STRETCHER DEVICE

Peter O. Frettem, 514 W. State St., Cannon Falls, Minn. 55009

Filed Jul. 24, 1985, Ser. No. 758,334

Int. Cl.[4] A61G *1/00*

U.S. Cl. 5—82 R **16 Claims**



1. A flexible carrying device for flexibly and adjustably transporting a human body, said flexible stretcher device comprising:

a. a flexible, rectilinear and elongated body support member having a top surface, a bottom surface and folded side edges, each of said folded side edges forming elongated tubular envelope members, each of said elongated tubular envelope members having a predetermined diameter and having an open end and a closed secured end opposite said open end, each of said envelope members further having closing and tightening strap means fixed to said flexible body member in proximity to said open end,

b. a pair of rigid tubular members for placement in said elongated tubular envelope members, each support member having a diametric dimension smaller than the predetermined diameter of said tubular envelope member and having a length that is less than the length of said body member, said closing and tightening strap means being folded over said open end of said tubular envelope member to securely hold said rigid support member within said tubular envelope member,

c. a pair of diagonally disposed flexible reinforcement straps fastened to the bottom surface of said carrying body member and being generally disposed diagonally across said bottom surface in a generally central cross-over configuration and extending to the opposite ends of said rectilinear body support member, said diagonal flexible straps terminating interiorly proximate the respective ends of said tubular envelope members, said diagonally disposed straps being constructed and arranged to transfer the weight of the human body placed on said stretcher device to the ends of said flexible body member and on to the ends of said rigid support members to put said rigid support members in a state of compression, and

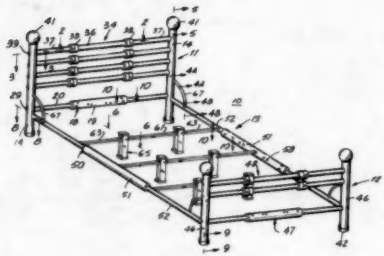
d. a pair of oppositely disposed elongated flexible handle member straps fastened to said top surface of said body member and extending generally the length of said body support member, each of said handle member strap further being disposed parallel to and interiorly of each said elongated tubular envelope member, each of said handle member straps being connected to said diagonally disposed flexible reinforcement straps, whereby, the placement of a human body on said body support member causes compressive forces to be exerted on said rigid support members by means of said diagonally disposed reinforcement straps and said envelope members secured about the rigid support members.

4,679,261

TELESCOPIC BED

Smith B. Stanley, c/o Haze, New York, N.Y. 10003, and Yoram A. Alroy, 54 Morton St., New York, N.Y. 10014

Continuation-in-part of Ser. No. 683,397, Dec. 17, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,331
Int. Cl.[4] A47C *19/04*
U.S. Cl. 5—183 8 Claims



1. A bed structure comprising:

a rear vertical head frame member of adjustable width including a pair of laterally spaced vertical tubular first posts and vertically spaced first cross pieces of adjustable lengths, each of said cross pieces above the lowermost cross piece including an intermediate tubular section and a pair of outer tubular sections telescoping opposite ends of said intermediate section and a soft compressible peripherally extending cushion member sandwiched between the confronting peripheral faces of said outer tubular sections and said intermediate section, and separable fastening means securing the opposite ends of said head frame cross pieces to respective head frame posts;

a front vertical foot frame member of adjustable width including a pair of laterally spaced vertical tubular second posts and vertically spaced second cross pieces of adjustable lengths each of said second cross pieces above the lowermost second cross piece including an intermediate tubular section and a pair of outer tubular sections telescoping opposite ends of said tubular section and soft compressible peripherally extending cushion member sandwiched between the confronting peripheral faces of said second cross piece outer tubular sections and the intermediate tubular section, and separable fastening means securing the opposite ends of said second cross pieces to respective second posts;

a pair of laterally spaced longitudinally extending parallel horizontal side beams of adjustable lengths extending between respective first posts and respective second posts substantially at the level of the lowermost cross pieces of said head and foot frame members and defining therewith a bottom frame and separable fastening means securing the opposite ends of said beams to respective pairs of said first and second posts;

mattress support means carried by said bottom frame and including longitudinally spaced parallel horizontal stringers of adjustable lengths extending between said beams; and

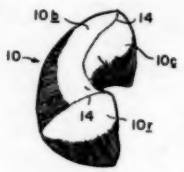
a gusset member located proximate the corner of the end portion of each beam and the portion of the post connected to and projecting above the respective beam and separable fastening means securing said gusset member at their ends to respective posts and beams at points spaced from said corners.

4,679,262

HEAD SUPPORT CUSHION

James R. Davis, 18 Denbow Rd., and Michael P. McConnell, 25 Faculty Rd., both of Durham, N.H. 03824

Filed Jun. 10, 1985, Ser. No. 742,761
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—434 14 Claims



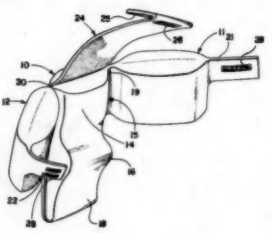
1. A cushion for supporting simultaneously the front and side of the head of a user reposing in a sitting or semi-reclining position, said cusion comprising a naturally curved relatively stiff body, the length and curvature of the body being such that when the body is positioned on the user's shoulder at one side of the midsagittal plane, the body extends from a location adjacent to the mastoid process behind the user's ear forwardly under the chin to a point beyond the midsagittal plane to the mental terminus of the user's mandible so that said body provides positive anatomically correct support for the user's head no matter which direction the head nods or tilts to said one side of the midsagittal plane.

4,679,263

HEAD SUPPORTED PILLOW

William A. Honer, Rt. 1, Box 202, Flowery Branch, Ga. 30542

Filed Oct. 2, 1985, Ser. No. 782,870
Int. Cl.[4] A47C *20/02*
U.S. Cl. 5—437 4 Claims



1. A pillow for supporting the head of a person, said pillow including a plurality of cushions, and means for hinging said plurality of cushions with respect to one another, said pillow including a back cushion engageable with the back of said person's head, a lefthand cushion engageable with the left side of said person's head, said lefthand cushion being hinged to said back cushion, a righthand cusion engageable with the right side of said person's head, said righthand cushion being hinged to said back cushion, said back cushion being of a size and shape to receive the back of said person's head and extend laterally substantially to the sides of said person's head and including a left edge and a right edge, said lefthand cushion having a rear end generally contiguous with said left edge of said back cushion and a front end lying generally at the edge of said person's face, said lefthand cushion having a height sufficient to cover the left side of said person's head above the neck of said person, said righthand cushion having a rear end generally contiguous with said right edge of said back cushion and a

front end lying generally at the edge of said person's face, said righthand cushion having a height sufficient to cover the right side of said person's head above the neck of said person, said means for hinging said plurality of cushions with respect to one another including a first hinge means for hinging said rear end of said lefthand cushion to said left edge of said back cushion, and second hinge means for hinging said rear end of said righthand cushion to said right edge of said back cushion, the arrangement being such that said back cushion holds the rear end of said right- and lefthand cushions with respect to each other, said back cushion, said righthand cushion and said lefthand cushion having a thickness such that the head of said person is held in a substantially natural position when said person is reclining, said pillow further including strap means extendable along the forehead of said person for holding the front ends of said right- and lefthand cushions with respect to each other with said cushions against said person's head, said strap means including releasable fastening means.

4,679,264

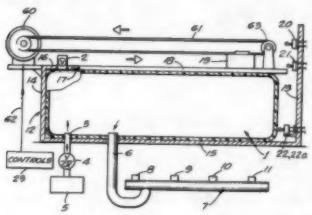
AIRBED MATTRESS INCLUDING A REGULATED, CONTROLLABLE AIR RESERVOIR THEREFOR

Carlos A. Mollura, 2824 Del Oro La., Fullerton, Calif. 92635

Continuation-in-part of Ser. No. 731,450, May 6, 1985, abandoned. This application Apr. 1, 1986, Ser. No. 846,857

Int. Cl.[4] A47C *27/10*

U.S. Cl. 5—453 **14 Claims**



1. A system comprising an air mattress or an air cushion linked in direct air communication with an air reservoir means comprising a flexible container that includes air inlet means and air outlet means; means for propelling air through said air inlet means; means for exerting controllable pressure on said air reservoir means; means for starting said propelling means, and means for stopping said propelling means, said pressure exerting means being adapted to activate said starting means when the air volume in said reservoir falls below a predetermined minimum and to activate said stopping means when the air volume in said reservoir means rises above a first predetermined maximum.

4,679,265

LIFT DEVICE FOR AN INCUMBENT PERSON

Jack W. Wicks, 9425 Blind Pass Rd., #1007, St. Petersburg Beach, Fla. 33706

Filed Sep. 27, 1985, Ser. No. 781,405

Int. Cl.[4] A61G *7/06*

U.S. Cl. 5—445 **7 Claims**

1. A lift device for an incumbent person for use with a mattress having an upper surface, an end, and an underside, with the end having a thickness dimension, comprising, in combination: means for grippingly engaging the mattress comprising a substantially rigid hook for connection with the thickness dimention of the mattress independent of any means associated with the mattress including a central portion having a length substantially equal to the thickness dimension of the mattress, a first leg extending from a first end of the central portion and having an outer free end, with the first leg tightly engaging the upper surface of the mattress, a second leg extending from an opposite end of the central portion and having an outer free end spaced from the outer free end of said first leg and forming an opening between said outer free ends of said first leg and said second leg, with the second leg tightly engaging the underside of the mattress, and with said opening of the hook

formed by the outer free ends of said first and second legs being of a dimension substantially equal to the thickness dimension of the mattress; and an elongated tether connected to said first leg adjacent the outer free end thereof, with the tether being of a flexible nature throughout its length.

4,679,266

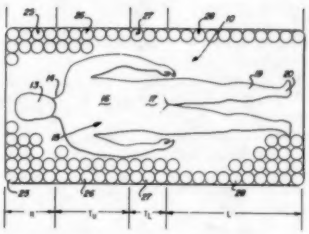
VARYING FIRMNESS MATTRESS

Eugene Kraft, 2760 W. Warren Ave., Detroit, Mich. 48208

Filed Feb. 18, 1986, Ser. No. 830,091

Int. Cl.[4] A47C *27/00*

U.S. Cl. 5—464 **7 Claims**



1. A standard type mattress formed with varying firmnesses for supporting a predetermined, generally average height and weight person comfortably and substantial level, comprising:

the mattress being divided into four major body support regions along its length, namely, a head support region, an upper torso support region, a lower torso support region and a leg support region;

the head support region extends from the mattress upper end towards the lower end a distance equal to roughly the height of an average head and neck beginning about at the juncture of the neck to the shoulders to the top of the head;

the upper torso support region extends a distance roughly equal to the average distance between about the neck and shoulder juncture to the waist, and the lower torso support region extends a distance roughly equal to the average distance between about the waist to the crotch so that the upper torso region is roughly two-thirds and the lower torso region is roughly one-third the length of an average person's torso;

and the leg support region extends from the lower torso support region to the lower end of the mattress a distance roughly equal to between about the height of the legs of an average person from the crotch to the bottom of feet;

and with each of the head and leg support regions and the upper and lower torso regions being constructed so that it

has its own uniform springy firmness, with the upper torso region being the most firm, the head region being of lesser firmness than the upper torso region, the leg region being of considerably lesser firmness than the head region, and the lower torso region being of the firmness of roughly about that of the head region;

and with the several firmnesses being pre-selected to provide a substantially level body support lengthwise upon the mattress.

4,679,267

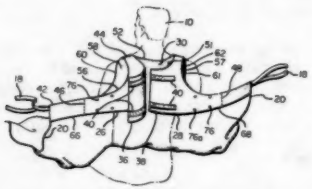
RESTRAINING SAFETY HARNESS

Edith A. Thiele, 405 W. Haven, New Lenox, Ill. 60451

Filed Mar. 31, 1986, Ser. No. 846,204

Int. Cl.[4] A47G 9/02; A61F 13/00

U.S. Cl. 5—494 **20 Claims**



1. For use with a person lying on a bed having a frame, an improved safety blanket comprising the combination of

a main generally rectangular panel sized to fit over the bed and substantially cover the person lying thereon,

one outer and two inner harness panels sized to fit substantially around the chest of the person, and over the shoulders of the person,

the inner and outer panels having edges defining openings to receive the person's head and arms,

the outer harness panel being formed as part of and continuous with the main blanket panel, near the top edge and mid-point thereof.

each inner harness panel being formed as part of and continuous with the outer harness panel, near spaced regions thereof that overlie the shoulders of the person,

each inner harness panel further being secured to the outer harness panel and the main blanket panel near spaced regions laterally and outwardly beyond the person,

the inner panels having ends designed to overlap with one another,

means to removable secure the lapped ends of the inner panels together, enclosing the harness panels as a continuous loop around the person, operable to hold the person relative to the blanket,

the securing means being in the form of cooperating hook-loop fasteners, allowing the lapped ends of the inner panels to be secured together at adjustable locations, to set the looseness of the harness panels circumferentially when secured on the person,

the lapped ends of the inner panels, when secured together, normally being in the back region and underlying the person lying on the bed and thereby being beyond the reach of the person's hands, for the person separating the lapped panels, by himself/herself, for the unsupervised removal from the restrainment of the blanket,

the regions of securement between each inner harness panel and the outer harness panel and the main blanket panel being spaced apart, when the adjacent panels are flat and extended tightly, between 15 and 25 inches,

additional releasible securing means secured onto the inner and outer harness panels, being laterally spaced inwardly from the adjacent region of securement of each inner harness panel to the outer harness panel and the main blanket panel, and when selectively secured together providing additional sizing adjustment of the harness, and

means at the corners of the main panel operable to secure the blanket to the bed frame and over the person lying on the bed.

4,679,268

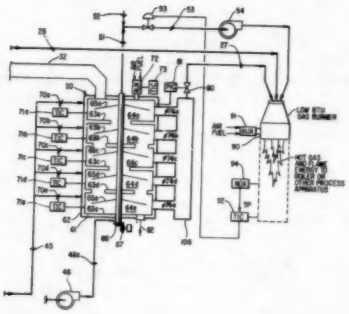
METHOD AND APPARATUS FOR BURNING SOLID WASTE PRODUCTS USING A PLURALITY OF MULTIPLE HEARTH FURNACES

Richard M. Gurries, Saratoga; Jay K. Johnson, La Honda, and Eric A. Nering, Moss Beach, all of Calif., assignors to Gurries & Okamoto, Inc., Cupertino, Calif. and Associated Mechanical Contractors, Inc., Greensboro, N.C.

Filed Sep. 11, 1986, Ser. No. 906,287

Int. Cl.[4] F23G 7/06

U.S. Cl. 110—346 **26 Claims**



1. A process for continuously burning solids comprising the steps:

a. partially burning said solid in a first multiple hearth furnace which is operated under reducing conditions and forming a carbon-containing char and a low Btu gas in said first multiple hearth furnace;

b. recovering said char from said first multiple hearth furnace and conveying said char to a second multiple hearth furnace which is operated under oxidizing conditions;

c. substantially completely burning the char recovered from said first multiple hearth furnace in said second multiple hearth furnace;

d. transporting said low Btu gas from said first multiple hearth furnace to a burner where substantially complete burning of said low Btu gas takes place; and

e. recovering oxygen containing gas from from said second multiple hearth furnace and utilizing said gas in said burner for burning said low Btu gas recovered from said first multiple hearth furnace.

4,679,269

HEEL LASTING MACHINE

Michael M. Becka, Nashua, N.H., and Walter Vornberger, Tewksbury, Mass., assignors to International Shoe Machine Corporation, Nashua, N.H.

Filed Mar. 27, 1986, Ser. No. 845,089

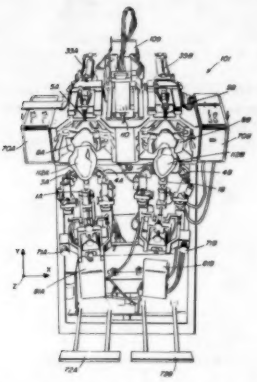
Int. Cl.[4] A43D 21/16, 21/00

U.S. Cl. 12—10.5 **19 Claims**

19. In a heel lasting machine having two stations to receive two footwear upper assemblies, each footwear upper assembly including a last, an insole on the last bottom and an upper draped about the last, said last having a spindle hole whose longitudinal position varies from last to last, said lasting machine being operable to apply a precisely positioned ribbon of adhesive onto the heel region of each of the two footwear upper assemblies, despite the variation in position of the spindle hole, said heel lasting machine comprising:

a single adhesive applying unit having a nozzle to deliver the

ribbon of adhesive to each of the two footwear upper assemblies at the heel region of each footwear upper assembly of the two footwear upper assemblies; and



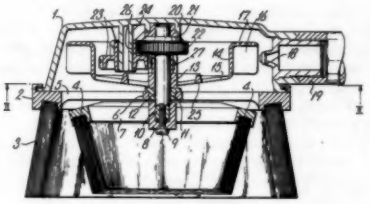
positioning means to establish spatial positioning between the nozzle and the heel region of said each footwear upper assembly of the two footwear upper assemblies to assure proper positioning of the ribbon pattern with respect to each of the footwear assemblies.

4,679,270

WASH BRUSH OPERATED BY THE WASH WATER

Giorgio Gaiti, Correggio Emilia, and Loris Ferrari, Carpi, both of Italy, assignors to G.F. S.r.l., Correggio Emilia, Italy

Filed Jan. 22, 1986, Ser. No. 821,338
Claims priority, application Italy, Mar. 1, 1985, 46818 A/85
Int. Cl.[4] A46B *13/06*
U.S. Cl. 15—29 **4 Claims**



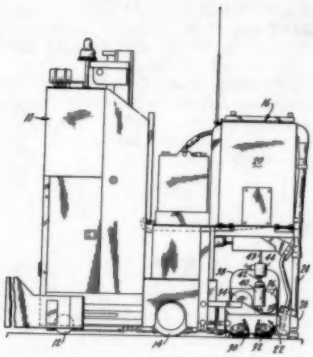
1. Apparatus for washing surfaces comprising, a pan-shaped casing having a closed top and an open bottom, a bladed impeller mounted for rotation within and generally coaxially of said casing, nozzle means converging into said casing for directing water generally tangentially of the bladed impeller to drive the impeller in rotation, said open bottom of the casing defining an outlet for the water from said nozzle so that the water flows along a flow path from the nozzle to the impeller and then through said outlet, said impeller having a body of cup shape which opens toward the closed top of the casing and defines with the top of the casing a region out of the flow path of the water flowing through the casing, a rotary brush adjacent said open bottom of the casing, a fixed brush connected to said casing and surrounding said rotary brush, reduction gear means connecting said impeller to said rotary brush for driving said brush in rotation at a speed less than the speed of rotation of the impeller, said reduction gear means being within said impeller body of cup shape in said region out of the flow path of water through the casing so that transmission of motion by the gears thereof is not opposed by the water flow.

4,679,271

AUTOMATIC TOOL FORCE COMPENSATOR FOR A SURFACE MAINTENANCE MACHINE

Bruce F. Field, Minneapolis, and Joseph G. Kasper, Gold Valley, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Mar. 14, 1986, Ser. No. 839,877
Int. Cl.[4] A47L *11/18, 11/20*
U.S. Cl. 15—49 C **9 Claims**



1. An automatic tool force compensator for a surface maintenance machine including,

means for raising and lowering surface maintenance tools,

means for setting a degree of tool application force that it is desired to apply to a surface and for providing an electrical signal representative thereof,

means for measuring the actual degree of tool application force applied to the surface and for providing an electrical signal representative thereof,

means for comparing said electrical signals and for operating said means for raising and lowering the surface maintenance tools in accordance therewith to provide the desired degree of tool application force

tool drive means, means for sensing load on the tool drive means and for providing an electrical signal representative thereof, and

means for comparing the tool drive means load signal with a reference, with the output of said means for comparing the tool drive means signal with a reference being connected to and providing an operating signal for said means for raising and lowering the surface maintenance tools.

4,679,272

TOOTHBRUSH

Max Florence, Toronto, Canada, assignor to Sulcabrush Inc., Toronto, Canada

Filed Feb. 5, 1986, Ser. No. 826,446
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—106 **11 Claims**

1. A toothbrush comprising an elongate, generally straight handle means, having first and second ends, and first and second brushing heads which have respective first and second axes and are generally identical, and each of which comprises a plurality of bristle elements forming a single rounded tuft which tuft has a height greater than its diameter and extends outwards about the respective first or second axis, with the

first brushing head extending at an acute angle to the handle means on one side thereof and the second brushing head ex-

tending at an obtuse angle to the handle means on the other side thereof.

4,679,273

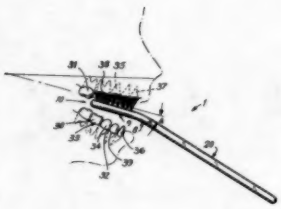
DENTAL APPLIANCE FOR CLEANSING THE GINGIVAL ONE THIRD AREAS OF THE TEETH AS WELL AS THE SULCULAR AND THE EMBRASURE REGIONS THEREOF

Seth Okin, 6 Tuddington Rd., Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 766,508, Aug. 19, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 919,598

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—167 R **11 Claims**



1. A dental appliance for cleansing the gingival one third areas of the teeth of a user as well as the sulcular and the embrasure regions thereof, said dental appliance comprising:

a brush head portion of elongate configuration having:

a proximal end,

a distal end, and

a length as measured from the said distal end to the said proximal end;

a plurality of tufts of bristles disposed along the said length of said brush head portion in a single phase, with each of said tufts of bristles being connected at one end to said brush head portion, said tufts of bristles being sized so as to define an undulating brushing surface formed from the other of the ends of said tufts of bristles, said brushing surface including:

a plurality of convex regions, each of which is configured to coincide with a portion of the free gingival margin adjacent to the facial surface of a selected, adult tooth, said convex regions of said tufts of bristles including at least one located at the said distal end of said brush head portion which is configured to coincide with a portion of the said free gingival margin adjacent to the facial surfaces of an average, adult molar,

a plurality of concave regions located adjacent to and alternating with the said convex regions of said tufts of bristles, said concave regions of said tufts of bristles being configured to coincide with the average of the interproximal margins that are located between the said selected teeth used in configuring the said convex regions of said tufts of bristles situated on either side thereof, said concave regions located adjacent to the said one convex region at the said distal end of said brush head portion having the configuration of the average interproximal margin that is located between adult molar teeth, and

a mean height, as measured in a direction normal to said brush heat portion, that increases from the said distal end of said brush head portion to the said proximal end of said brush head portion;

a handle portion of elongate configuration connected to said brush head portion at the said proximal end thereof; and

a neck portion connecting said handle portion to said brush head portion.

4,679,274

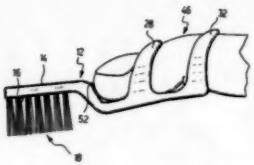
FINGER MANIPULATED ORAL HYGIENE DEVICE

Jack C. Friedman, 750 W. Broadway #809, Vancouver, British Columbia, Canada V5Z 1H7

Filed Jul. 24, 1985, Ser. No. 758,652

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—167 R **11 Claims**



1. An oral hygiene device for mounting on and manipulated by a user's finger, said device comprising a stem, an oral hygiene working head provided on said stem, and means for mounting said stem on a user's finger, said stem having upper and lower surfaces, said working head being provided on said stem lower surface and said mounting means being provided on said stem and extending upwardly relative to said stem, said working head being offset from said mounting means along said stem, said stem having a stepped portion between said working head and said mounting means to elevate thereby a portion of said stem provided with said working head relative to a portion of said stem provided with said mounting means, wherein said mounting means comprises two pairs of lugs, said lugs of each pair opposing one another across said stem and said pairs of lugs being spaced apart along said stem a sufficient distance to position said pairs of lugs to each side of a first knuckle of a user's finger when said device is in use, said lugs extending upwardly from said stem upper surface and being curved towards one another to conform to a contour of a user's finger, said lugs overlying an upper portion of a user's finger, said lugs engaging a corresponding portion of a user's finger to clamp a user's finger between opposing lugs of said pairs of lugs to mount securely thereby said oral device on a user's finger, said stepped portion of said stem provides a stop for an end of a user's finger when clamped by said pairs of lugs.

4,679,275

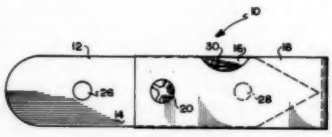
PAINT SCRAPER

Timothy L. Shannon, 1901 Sackett Ave., Cuyahoga Falls, Ohio 44223

Filed Mar. 7, 1986, Ser. No. 837,298

Int. Cl.[4] B44D *3/16*

U.S. Cl. 15—236 R **15 Claims**



1. A paint scraper, comprising: an elongated member having a handle portion at a first end thereof and a scraper head por-

tion at a second end thereof, said head portion defined by angled edges of said elongated member joining at a point, said angled edges being normal to top and bottom flat planar surfaces of said elongated member, said elongated member being received by a sheath at a pivot point between said handle and head portion.

4,679,276

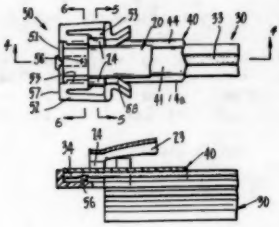
RETAINING MEANS

Frederick J. Tomkin, 4 Queensway, London W2, England

Filed Jul. 29, 1985, Ser. No. 760,311

Int. Cl.[4] B60S *1/38, 1/02*

U.S. Cl. 15—250.42 **11 Claims**



1. A releasable retaining means for restraining a squeegee element against longitudinal movement relative to a flexible resilient squeegee element backing strip and for limiting longitudinal movement of the backing strip relative to a harness of a windscreen wiper blade assembly, the retaining means comprising a clip having a body portion and at least one leg resiliently connected thereto having an inwardly directed tab portion, wherein the tab portion of the or each leg and the body portion together with the backing strip form a receiving means for engaging a claw of the harness, whereby to limit longitudinal movement of the backing strip relative to the harness, and, wherein the body portion includes an anchoring means adapted to penetrate into the backing strip and compress a portion of the squeegee element into frictional engagement with the backing strip, whereby to restrain the squeegee element against longitudinal movement relative to the backing strip.

4,679,277

FULL LENGTH INTERLOCKING HINGE FOR A FOLDING DOOR

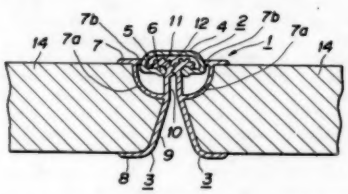
Yoji Shibata, Tokyo, Japan, assignor to Shin Nihon Koku Seibi Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,862

Claims priority, application Japan, Dec. 10, 1984, 59-187157[U]

Int. Cl.[4] E05D *7/00*

U.S. Cl. 16—354 **3 Claims**



1. A hinge for use in a folding door, comprising:

A basic frame extending loingitudinally and having a generally C-shape in cross-section, said basic frame having support shafts extending longitudinally and disposed one on each edge of said basic frame to form a longitudinal opening therebetween;

a pair of moving frames each having opposed longitudinal flanges supporting the longitudinal edge of a door therebetween;

supporting pieces extending from the moving frame, through said longitudinal opening into the center of said basic frame, the tips of said supporting pieces from each of the moving frames contacting and co-acting with one another, the interior surface of each of said tips being formed in a generally semicircular shape to cooperatively engage one of said support shafts for rotation therearound; and

a longitudinal edge extending from one of the longitudinal flanges of each moving frame such that said longitudinal edge is in constant contact with the outside surface of the basic frame as it slides along the outside surface of said basic frame, to form a light and odor seal.

4,679,278

METHOD OF MAKING A HYDROPHILIC COTTON FLEECE

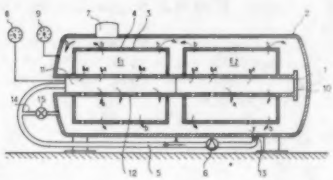
Jean-Francois Caumont, Brionne, France, assignor to Tempo Sanys, Paris, France

Division of Ser. No. 634,720, Jul. 26, 1984. This application Nov. 1, 1985, Ser. No. 793,814

Claims priority, application France, Sep. 21, 1983, 83 15026

Int. Cl.[4] D01B *9/00*

U.S. Cl. 19—66 CC **9 Claims**



1. Hydrophilic cotton fleece made in accordance with the following method: subjecting raw cotton on carding machines successively to preliminary beating and opening to obtain cotton and flocks which are opened and physically cleaned, placing flocks so treated on perforated cylinders on which they deposit themselves fairly uniformly to form a fleece which is fluffy and has practically no cohesion; placing this fleece in a wetting bath consisting of warm water to which a wetting agent is added to obtain a fleece which is more compact and has a certain firmness by physical cohesion; removing the fleece from the wetting bath and drying it between calender rollers; winding the fleece on a cylinder to obtain a coil which is then introduced into an autoclave to undergo boiling and bleaching operations, which operations are characterized in that during boiling and bleaching, treatment liquids are made to circulate radially through the turns of the coil in such a way that a differential pressure is established between the liquid entering the coil and the liquid leaving it, by reason of the losses of load due to the difficulty which the liquid experiences in passing through the coil, and this differential pressure brings about displacement and tangling of the cotton fibres because of the effect of hydraulic tufting on the whole of the volume of cotton distributed over the coil, thus considerably increasing the cohesion of the fleece obtained after unwinding.

4,679,279

SLIVER COILER

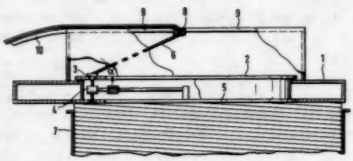
Jürgen Klüttermann, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed May 12, 1986, Ser. No. 862,245

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517060

Int. Cl.[4] B65H *54/80*

U.S. Cl. 19—159 R **12 Claims**



1. In a sliver coiler including a unidirectionally rotating rotary head assembly having a radius and a generally horizontal plane of rotation; a sliver trumpet eccentrically mounted in the rotary head assembly and a sliver supporting means including a fixedly held, immovable sliver guide element situated centrally above said rotary head assembly at a distance therefrom; the sliver having an unsupported running portion extending through a free space linearly from said sliver guide element to said sliver trumpet; the improvement wherein the angle formed between said plane of rotation and a line connecting said sliver guide element with said sliver trumpet is 30° at the most, permitting high running speeds of the sliver.

4,679,280

FASTENERS FOR CHAINS, NECKLACES, BANGLES, AND SIMILAR PIECES OF JEWELRY

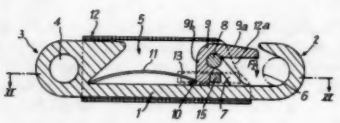
Roland Krahenbuhl, 30 route de Nogent-sur-Seine, Soucy, 89100 Sens, France

Continuation of Ser. No. 672,589, Nov. 19, 1984, abandoned. This application Jun. 4, 1986, Ser. No. 873,431

Claims priority, application France, Nov. 21, 1983, 83 18471; Nov. 12, 1984, 84 17203

Int. Cl.[4] A44B *13/02*

U.S. Cl. 24—233 **9 Claims**



1. In a fastener comprising a main elongated body having two ends, with one end of said elongated body being provided to be fixedly connected to one end of a two-end piece of jewelry and an other end of said elongated body being hook-shaped; said elongated body further having a central recessed part supporting a heel including a spindle; an angle shaped rocker being pivotally mounted on said spindle and having two arms; spring means cooperating with one of the two arms of said angle shaped rocker and urging a second one of said two arms towards the hook shaped end of said elongated body to close said hook shaped end; and a casing at least partially enclosing said elongated body;

the improvement wherein said casing has two side walls each provided with an opening; and wherein the central recessed part is provided with a substantially H-shaped sliding part having a central portion and two wings, with said central portion being mounted between said heel and said one of the two arms of said angle shaped rocker, and said two wings being each provided to extend through said opening of the casing;

the central portion of the sliding part adapted to push said one arm of the angle shaped rocker against the bias of said spring means;

whereby slidingly pushing the wings of the substantially H-shaped sliding part causes the central portion thereof to pivot the angle-shaped rocker against biasing of said spring means and to open the hook shaped end of the elongated body for enabling the introduction therein of an end of said piece of jewelry, and whereby the wings of the H-shaped sliding part substantially cover the openings and prevent dirt and the like from entering the fastener.

4,679,281

AUTOMATIC LOCKING SLIDER WITH A PAIR OF PULL TABS

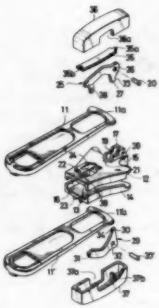
Susumu Ishii, Kurobe, and Kiyoshi Oda, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 7, 1986, Ser. No. 860,579

Claims priority, application Japan, May 24, 1985, 60-76408[U]

Int. Cl.[4] A44B *19/30*

U.S. Cl. 24—422 **1 Claim**



1. An automatic locking slider for a slide fastener having a pair of rows of coupling elements, said slider comprising:

(a) a slider body including a pair of upper and lower flanged wings joined at one end by a neck to define therebetween a substantially Y-shaped guide channel for the passage therethrough of the pair of rows of coupling elements, each of said wings having a support post at one end adjoining said neck, each support post having a recess, said slider body having a through opening extending through said neck and said two support posts;

(b) a pair of first and second locking members supported on said upper and lower wings, respectively, and each mounted on a pivot pin rockably received in said recess of a respective one of said support posts, said upper locking member having at one end a locking prong projectable into and retractable from said guide channel in response to pivotal movement of said upper locking member, and at the other end a first link arm projecting into said through opening, said lower locking member having at one end a second link arm projecting into said through opening and engageable with said first link arm in response to pivotal movement of said second locking member;

(c) a pair of first and second housings mounted on said upper and lower wings, respectively, and each having a pin retainer projecting from an inner wall of each of said first and second housings for retaining said pivot pin of each of said first and second locking members in the respective recess;

(d) a leaf spring acting between said first housing and said first locking member for normally urging the latter to pivotally move in such a direction that said locking prong projects into said guide channel; and

(e) a pair of pull tabs operatively connected to said first and second locking members, respectively, for pulling the respective locking members so as to pivotally move the same against the bias of said leaf spring in such direction that said locking prong is retracted from said guide channel.

4,679,282

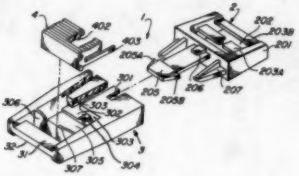
PRESS FASTENER

Lung S. Feng, 7F, No. 180, Lane 415, Kuang Fu S. Rd., Taipei, Taiwan

Filed Jun. 4, 1986, Ser. No. 870,541

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—614 **3 Claims**



1. A press fastener, including the combination of:

a plug body including outwardly extending elastic tongue part positioned at one end of said plug body, said tongue part containing a climbing angle peak along a front portion thereof;

a slotted body including an angled receiving groove extending interiorly from one end of said slotted body to a press groove creating a gap in a central portion thereof for allowing said elastic tongue part to extend through said receiving groove such that said climbing angle peak of the tongue part extends into said press groove to fasten said plug body to said slotted body; and

an elastic press body positioned in the press groove of said slotted body supported thereby for allowing downward pressure exerted upon said elastic press body to be transmitted to said climbing angle of the elastic tongue part to thereby unfasten said plug body from said slotted body.

4,679,283

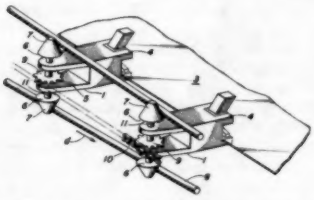
DEVICE FOR BIAXIALLY STRETCHING FILM

Albert W. Forrest, Jr., Chillicothe, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1985, Ser. No. 728,880

Int. Cl.[4] D06C *3/04*; B29C *55/16*

U.S. Cl. 26—73 **4 Claims**



1. In a device for stretching film simultaneously in two directions composed of a tenter frame with film clips to grip the edges of a continuous web of film, wherein the film clips are affixed to varying velocity carriers, and wherein the sides of the tenter frame diverge to stretch said web of film transversely in the direction of film travel and simultaneously stretching the film longitudinally in the direction of film travel by acceleration of the film between said carriers, said varying velocity carriers each comprising a movable carrier body and a stationary support therefor composed of track means in which the carrier body can move and rail means out of parallel with said track means, the improvement comprising at least one conical driver within said carrier body adapted to contact said rail means and means for rotating said driver, said conical driver adapted to move said carrier body along said track means at a velocity dependent upon the point of contact of the face of said driver with said rail means.

4,679,284

YARN ENTANGLING AIR JET

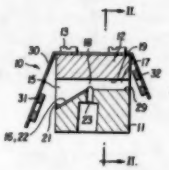
Geoffrey Naylor, and Christopher J. Lawrence, both of Macclesfield, United Kingdom, assignors to Rieter-Scragg Limited, Cheshire, United Kingdom

Filed May 21, 1986, Ser. No. 865,340

Claims priority, application United Kingdom, Jul. 20, 1985, 8518390

Int. Cl.[4] D02G *1/16*; D02J *1/08*

U.S. Cl. 28—272 **20 Claims**



1. An entangling jet having a yarn passageway extending therethrough with an air inlet passageway and a yarn threading slot each communicating with said yarn passageway, said yarn passageway having a base surface, an inlet portion and an outlet portion and being defined in said outlet portion by said base surface and by side surfaces defining an apex opposed to said base surface and providing a reducing width of passageway away from said base surface towards said apex, said yarn passageway being defined in said inlet portion by said base surface and by an inlet surface opposed to and converging towards said base surface in a direction towards outlet portion, said air inlet passageway communicating with said apex of said outlet portion, one side surface of said yarn passageway having an opening therein which is substantially parallel with said base surface and spaced therefrom towards said apex and with which said yarn threading slot communicates, said jet being formed by two parts separably secured to each other, said two parts having at said one side of said yarn passageway two mutually spaced surfaces defining between them said opening and said yarn threading slot, and at the other side of said yarn passageway two mutually contacting surfaces.

15. An entangling jet comprising:

(a) a lower part having an upper surface, a lower surface, a front surface, a rear surface, and two side surfaces, said upper surface of said lower part comprising, beginning at a first one of said two side surfaces of said lower part, a first planar surface extending from said front surface of said lower part to said rear surface of said lower part, a wall extending from said front surface of said lower part to said rear surface of said lower part and forming the bottom of a yarn passageway, a second planar surface parallel to but spaced downwardly from said first planar surface of said lower part, and a downwardly extending guide surface extending from said second planar surface of said lower part to the second one of said two side surfaces of said lower part and from said front surface of said lower part to said rear surface of said lower part, said yarn passageway comprising an inlet portion and an outlet

portion, the height of said inlet portion being at a maximum at said front surface of said lower portion and sloping to a minimum where said inlet portion meets said outlet portion, an air inlet passageway being formed in said lower part and extending from said lower surface of said lower part to said yarn passageway where said inlet portion meets said outlet portion;

(b) an upper part having an upper surface, a lower surface, a front surface, a rear surface, and two side surfaces, said lower surface of said upper part comprising, beginning at a first one of said two side surfaces of said upper part, a first planar surface extending from said front surface of said upper part to said rear surface of said upper part, said first planar surface of said upper part being sized, shaped, and positioned to make surface abutting contact with said first planar surface of said lower part, a base wall extending from said front surface of said upper part to said rear surface of said upper part and forming the top of said yarn passageway, said base wall being coplanar with said first planar surface of said upper part, a second planar surface parallel to but spaced downwardly from said first planar surface of said upper part, said second planar surface of said upper part being sized, shaped, and positioned to be parallel to but spaced from said second planar surface of said lower part to define a yarn threading slot therebetween, and an upwardly extending guide surface extending from said second planar surface of said upper part to the second one of said two side surfaces of said upper part and from said front surface of said upper part to said rear surface of said upper part; and

(c) means for releasably connecting said upper and lower parts together.

4,679,285

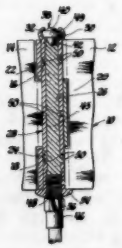
METHOD OF MAKING A LUBRICATED HINGE PIN

David B. Ballantyne, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1985, Ser. No. 797,957

Int. Cl.[4] B21D *53/40*; E05D *5/10*

U.S. Cl. 29—11 **2 Claims**



1. A method of making a lubricated hinge pin that fits in axially aligned barrel sections of a pair of hinge plates to pivotally connect same to form a hinge comprising the steps of:

forming the hinge pin as a hollow cylindrical body with an outer diameter that is receivable with a close fit in the barrel sections,

forming a radially expansible portion terminating with an internal stop shoulder on one end of the cylindrical body,

forming a preformed head and lubricant entrance on the other end of the cylindrical body,

forming lubricant delivery holes in the cylindrical body intermediate said ends,

forming a mandrel having an extruding head and a shank connected to the extruded head by a breakaway portion,

assembling the mandrel in the cylindrical body so that the extruding head is located in said one end and the shank extends through the cylindrical body and outward past said other end,

inserting the cylindrical body with the mandrel in the barrel sections with the preformed head abutting one side of the hinge and the stop shoulder aligned with the opposite side of the hinge,

pulling the extending portion of the shank so as to radially expand the expansion portion of the cylindrical body with the extruded head to abut said other side of the hinge and until the extruding head is stopped by the stop shoulder and retained by such forming action to close and seal said one end of the cylindrical body,

continuing to effect such pulling until the breakaway portion breaks with the extruding head stopped by the stop shoulder to thereby release the shank for removal from the cylindrical body and leave the extruding head in place to permanently close and seal said one end,

inserting lubricant in the cylindrical body through said entrance, and

sealingly closing said entrance.

4,679,286

MULTIFACE MACHINING MACHINE TOOL

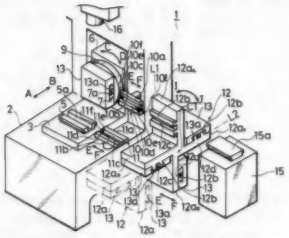
Shoji Momoi, Kagamihara, and Sumiaki Inami, Aichi, both of Japan, assignors to Yamazaki Machinery Works, Ltd., Aichi, Japan

Filed Feb. 12, 1986, Ser. No. 828,746

Claims priority, application Japan, Feb. 25, 1985, 60-35912

Int. Cl.[4] B23Q *41/02*; B65G *47/00*

U.S. Cl. 29—33 P **2 Claims**



1. A multiface machining machine tool including a spindle for mounting a tool thereon and being capable of machining at least two faces of a workpiece loaded on a pallet by means of said tool, whereby said multiface machining machine tool comprises:

a workpiece rotatably holding means for rotatably holding said pallet at a position opposite to said spindle;

a workpiece holding means for holding a face of the workpiece other than the face machined by the tool of the spindle when said workpiece rotatably holding means is holding the workpiece opposite to the spindle;

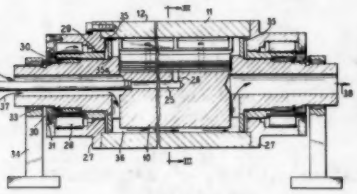
a pallet changer provided with a main body rotatably held by a driving means and formed with a plurality of wings arranged in a windmill shape, and workpiece supporting means for loading a pallet on each one of said wings; and

an intermediate station having transfer means for transferring the workpiece between said workpiece rotatably holding means, workpiece holding means, and said pallet changer.

4,679,287
HEATED VARIABLE CROWN ROLL

Andre Allard, Kalamazoo, Mich., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 4, 1984, Ser. No. 657,738
Int. Cl.[4] B21B *13/02*
U.S. Cl. 29—116 AD **6 Claims**

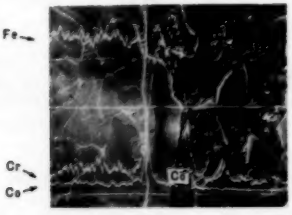


1. A roll for operating at a predetermined temperature comprising, in combination:
- a rotable roll having a cylindrical working face and a longitudinal axis;
- a stationary shaft means for supporting the rotable roll;
- bearing means at each end of the roll between the shaft means and the roll, whereby an imaginary line which is perpendicular to the longitudinal axis and passes through a bearing does not pass through the working face;
- an annular insulating fluid chamber adjacent each end of the roll shell between a respective bearing means and each respective end of the roll for reducing thermal transmission between the roll and bearing means,
- means for delivering a heated fluid to the roll to maintain the roll at a working temperature, and
- means for delivering an insulating fluid separate from the heated fluid to each of said chambers for absorbing heat from the roll and preventing said heat from the heated fluid from reaching the bearing means.

4,679,288
SURFACE TREATMENT OF A ROLLING MILL ROLL

Guy Monfort, Braives; Jean Crahay, Francorchamps, and Adolphe Bragard, Esneux, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Continuation of Ser. No. 797,439, Nov. 13, 1985. This application Nov. 24, 1986, Ser. No. 935,094
Claims priority, application Belgium, Nov. 14, 1984, 6/48029
Int. Cl.[4] B21B *1/00, 3/00*
U.S. Cl. 29—121.8 **7 Claims**

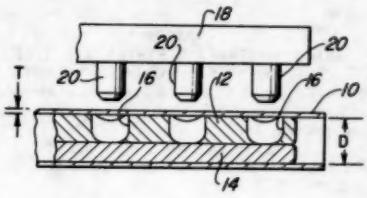


1. In a method for the surface treatment of a rolling mill roll, including depositing on the roll surface a layer of a material which is at least partly metallic, directing an intermittent laser beam at the surface of said layer while rotating said roll about its longitudinal axis, melting the layer surface in each successive impact zone of the laser beam, forming in said impact zone a microcrater surrounded by a rim and solidifying the rim, the successive microcraters being distributed according to a determined pattern in order to impart a controlled roughness to said surface, the improvement comprising providing the material of said layer with at least one hardening component or at least one component which can react with at least one constituent of the material of said roll to form said hardening component, melting also the material of said roll surface in the successive impact areas of the laser beam, alloying said molten roll material with said molten layer material in said impact areas, and forming an alloyed rim around each of said microcraters.

4,679,289
METHOD AND APPARATUS FOR FORMING INTRUDED BRANCH ATTACHMENT STRUCTURES IN TUBING

Donald E. Miller, Adrian, Mich., assignor to Brazeway, Inc., Adrian, Mich.

Filed Aug. 15, 1986, Ser. No. 896,979
Int. Cl.[4] B21D *53/00*; **B23D** *21/14*
U.S. Cl. 29—157 R **2 Claims**



1. Apparatus for forming intruding branch attachment structure in tubing comprising:
- a mandrel locatable within a length of extrudable metal tubing, said tubing having an inner diameter D and a wall thickness T, said mandrel having an upper section and a lower section, the upper and lower sections being disposed in mutually slideable, stacked relationship to occupy essentially the entire interior diameter D of the tubing, the upper section having formed therein one or more pockets of interior dimension less than D and opening to the interior wall surface of the tubing; and
- a punch having at least one punch head portion aligned with a pocket in the upper section of said mandrel, the punch head portion being of a lateral dimension which is less than the interior dimension of the pocket with which it is aligned, said punch being driveable through the wall of said tubing and into said pocket thereby to displace the wall material of said tubing into the gap between the punch head portion and the pocket to form an intruded sleeve in said tubing.

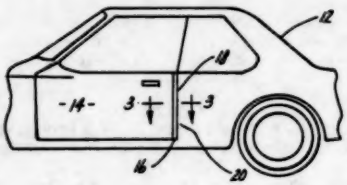
4,679,290
METHOD OF DE-EMPHASIZING THE GAP BETWEEN A DOOR EDGE AND ADJACENT STRUCTURE

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Division of Ser. No. 604,186, Apr. 26, 1984, Pat. No. 4,587,761. This application Mar. 13, 1986, Ser. No. 839,745
Int. Cl.[4] B23Q *17/00*
U.S. Cl. 29—407 **5 Claims**

1. The method of concealing the gap between the trailing edge of a vehicle swinging closure and adjacent body structure against which the trailing edge closes and for concurrently protecting the trailing edge by means of an edge guard applied over said edge, said method comprising providing an elongated edge guard having a base connecting inner and outer spaced legs when viewed in cross section of such a length to provide a range of adjustment fits of the edge guard on the edge whereby the edge guard may be more or less fully inserted onto the edge, installing the edge guard legs on the edge with there being an initially pliable, but subsequently harden-

able filler material between the spaced legs at the base of the edge guard and the edge, adjusting the edge guard on the edge so that the edge guard substantially fills said gap and allowing



the filler material to harden and provide a substantially permanent locator between the adjusted position of the base of the edge guard and the edge.

4,679,291

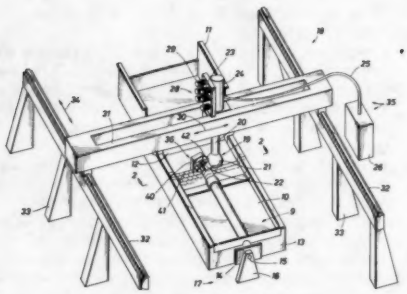
ROBOTIC STAPLING SYSTEM FOR FIBER PLACEMENT FOR COMPOSITE PARTS

Walter R. Schmeal; Nazim S. Nathoo, both of Houston, Tex., and John A. Neate, Miles, Mich., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1986, Ser. No. 832,949

Int. Cl.[4] B23P *11/00, 19/00;* B32B *31/00*

U.S. Cl. 29—432 **8 Claims**



1. A method for fabricating a filament-reinforced part using a core member having recesses defined in the surface thereof, said method comprising:

mounting the core member;

placing filament matrix means against said recesses formed in the surface of said core member; and

fastening the filament matrix means in place in said recesses of said core member.

4,679,292

METHOD FOR SECURING A PANEL TO A STRUCTURAL MEMBER

Albert R. Mead, Setauket, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 24, 1985, Ser. No. 779,766

Int. Cl.[4] B29C *27/00*

U.S. Cl. 29—447 **8 Claims**

1. A method for securing a panel to a structural member comprising the steps:

integrally forming an enlarged edge of the panel;

integrally forming a bifurcated edge on a connector made of memory metal alloy;

inserting the enlarged edge of the panel into the bifurcated edge of the connector during a first temperature condition;

subjecting the connector to a second temperature condition causing contraction of the bifurcated edge thus clamping the enlarged panel edge thereto; and

fastening the structural member to the connector.

4,679,293

METHOD OF MAKING A RAILROAD TRACK INSULATOR UNIT

James S. Bryan, Clyde, and Roger D. Meadows, Waynesville, both of N.C., assignors to Dayco Products, Inc., Dayton, Ohio

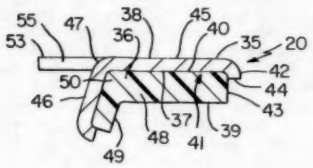
Division of Ser. No. 531,120, Sep. 9, 1983, Pat. No. 4,569,477.

This application Dec. 5, 1985, Ser. No. 804,726

The term of this patent subsequent to Feb. 11, 2003, has been disclaimed

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—450 **7 Claims**



1. In a method of making a railroad track insulator for holding a railroad rail against its foundation means and comprising the steps of securing a generally L-shaped configuration metallic part and a generally L-shaped configuration polymeric part together so that the polymeric part is adapted to engage said rail, forming said metallic part to have an open side recess means in one of the opposide sides thereof with said recess means being defined by a peripheral flange means on each edge thereof, and disposing and securing said polymeric part in said recess means so as to have a peripheral edge means thereof supported by said peripheral flange means of said metallic part, the improvement wherein said step of forming said metallic part comprises the step of stamping a sheet of metallic material to bend same into such a configuration.

4,679,294

METHOD FOR MAKING A TRIMETALLIC CYLINDER

Donald P. Lomax, 649 Stourbridge Pl., P.O. Box 232, Wales, Wis. 53183, and Ronald M. Boggs, P.O. Box 253, Genesee, Wis. 53127

Division of Ser. No. 396,623, Jul. 9, 1982, abandoned. This application Nov. 25, 1985, Ser. No. 801,296

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—460 **3 Claims**

1. A method for making a trimetallic cylinder comprising the steps of:

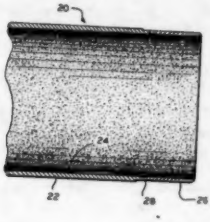
providing a metal cylinder;

welding an end ring onto each end of said metal cylinder, said end rings being of a material which is more corrosion resistant than said metal cylinder, said welding step providing a cylinder having a common bore;

placing in said cylinder a quantity of a lining alloy having a melting point less than said metal cylinder and said end rings;

placing end caps on said cylinder and heating said cylinder above the melting point of said lining alloy;

spinning said cylinder about its axis to centrifugally coat the bore of said cylinder with said lining alloy and to form a



metallurgical bond between said lining alloy and said bore of both the cylinder and rings, and,

cooling said cylinder, removing said end caps and finishing the inner surface of said cylinder.

4,679,295

MODULAR MACHINE TOOL FOR SERIES MACHINING OF PARTS IN A BAR

Angel Lopez, Les Geneveys-sur-Coffrane, Switzerland, assignor to Jean Greub S.A., La Chaux-de-Fonds, Switzerland

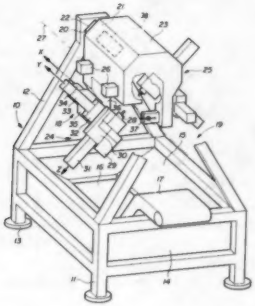
PCT No. PCT/CH85/00153, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/02305, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 11, 1985, Ser. No. 879,102

Claims priority, application Switzerland, Oct. 16, 1984, 4942/84

Int. Cl.[4] B23P *23/00*; B23Q *7/04*

U.S. Cl. 29—564.8 **12 Claims**



1. A modular machine tool for machining series of parts from a bar of raw material, said machine tool comprising at least one module equipped with at least one machining station, means for transporting a bar of raw material in position and maintaining said bar in position, an indexing device for forming indexing marks on said bar, said machining station comprising at least one machining unit having independent drive means adapted to displace said machining unit with respect to said bar of raw material, each said module being provided with a rigid chassis comprising a rectilinear connecting beam disposed parallel to said bar of raw material, said machining station forming a part of said module being swingably mounted on said connecting beam, and said chassis comprising a lower frame forming a case and an upper prism-shaped frame, said lower frame being configured to contain at least one of a lubricating unit and means for the removal of chips, said upper frame comprising said connecting beam and end elements connecting said beam to said lower frame.

4,679,296

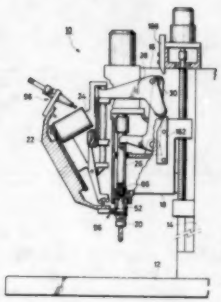
MACHINE TOOL

Kikuo Watanabe, Aichi; Mitsuo Kobayashi, Mie; Noboru Hirose, and Keiichi Sato, both of Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 23, 1985, Ser. No. 768,750

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **3 Claims**



1. A machine tool for machining a work piece, the machine tool of the type having as main spindle head rotatably supporting a main spindle with a tool mount at one end, the spindle head being reciprocable relative to the machine tool frame in the axial direction of the main spindle, the machine tool further comprising:

a tool holding member installed in the tool mount of said main spindle;

automatic means for changing a tool held in said tool holding member during "double action" reciprocal tool-changing movement of said spindle head, said automatic means including:

a. a tool support carried on said frame and movable in the axial direction of said main spindle independently of said main spindle;

b. a tool magazine rotatably supported on, and axially movable with, said tool support and having a plurality of tool holders each capable of detachably holding said tool, and spaced about the magazine periphery, said magazine for indexing a selected tool holder into and out of axial alignment with said main spindle;

c. first cam-and-crank means interconnecting said main spindle head, said frame, and said tool support for moving said tool support together with said spindle head a predetermined distance during the "double action" movement of said main spindle head relative to said frame, the tool being held in said main spindle also being engaged to be held by one of said plurality of tool holders of the tool magazine during movement in said predetermined distance;

d. second cam-and-crank means interconnecting said main spindle head and said frame for causing said tool holding member to release the tool from the tool holding member during a preselected portion of said "double action" movement; and

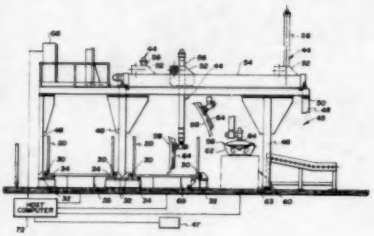
e. means for preventing movement of said tool support below a fixed axial location, the spindle head being axially movable below said fixed location for performing machining operations.

4,679,297

METHOD FOR CHANGING THE TOOLING IN A ROBOT-BASED SYSTEM AND SYSTEM UTILIZING SAME

Robert E. Hansen, Jr., New Baltimore; James R. Murray, and Roberta L. Zald, both of Troy, all of Mich., assignors to GMF Robotics Corporation, Troy, Mich.

Filed May 15, 1986, Ser. No. 863,333
Int. Cl.[4] B23Q *3/155*
U.S. Cl. 29—568 **20 Claims**



1. A method for automatically changing tooling of a robot-based system, the method comprising:

indexing a first container into a work envelope of a robot having a first end effector connected to a distal end of an arm;

conveying at least one fixture adapted to support a first part in a desired position and orientation into the work envelope;

controlling the robot so that the robot removes the fixture from an operative position and places the fixture in the first container;

moving the first container out of the work envelope;

indexing a second container having a second fixture adapted to support a second part in a desired position and orientation into the work envelope;

controlling the robot so that the robot picks up and places the second fixture in an operative position in preparation for conveyance of the second part; and

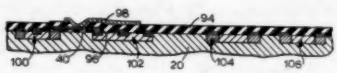
moving the second container out of the work envelope.

4,679,298

METHOD OF FABRICATION OF GAAS COMPLEMENTARY ENHANCEMENT MODE JUNCTION FIELD EFFECT TRANSISTOR

Rainer Zuleeg, San Juan Capistrano; Johannes K. Notthoff, Lomita, and Gary L. Troeger, Fountain Valley, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 570,951, Jan. 16, 1984, Pat. No. 4,568,957. This application Aug. 30, 1985, Ser. No. 771,524
Int. Cl.[4] H01L *21/00*
U.S. Cl. 29—571 **4 Claims**



1. A process for forming a GaAs integrated circuit structure containing complementary enhancement mode junction field effect transistors (JFET) comprising:

forming at least one n channel JFET structure in a first main surface of a semi-insulating GaAs substrate, the process for forming the n channel JFET comprising:

forming source and drain regions by a first ion implantation of n type impurity ions into two regions of the substrate separated by an intermediate region;

forming a channel region by exposing a portion of the intermediate region to a second ion implantation of further n type impurity ions, the second implantation also implanting into the source and drain regions; and

forming a gate region by exposing a portion of the channel region to a third ion implantation of p type impurity ions; then emplacing electrical contacts atop the source, drain and gate regions; and

forming at least one p channel JFET structure in said first main surface of the substrate, the process for forming the p channel structure comprising:

forming a p channel region by a channel ion implantation of p type impurity ions into the substrate;

forming source and drain regions by ion implantation of p type impurity ions into respective spaced-apart areas of the p channel region while protecting the remainder of the p channel region from this ion implantation; and

forming a gate region by exposing a portion of the channel region intermediate the source and drain regions to an ion implantation of n type impurity ions; then forming electrical contacts atop the source, drain and gate regions

wherein the ion implantations into the substrate pass through a protective layer of silicon-nitride sufficient to provide a consistent and fixed depth reference for the ion implantations, the protective layer being removed beneath at least the electric contacts.

4,679,299

FORMATION OF SELF-ALIGNED STACKED CMOS STRUCTURES BY LIFT-OFF

Nicholas J. Szluk, Albuquerque, N. Mex., and Gayle W. Miller, Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 11, 1986, Ser. No. 895,407
Int. Cl.[4] H01L *29/78, 29/04, 27/02*
U.S. Cl. 29—571 **18 Claims**

1. A process for fabricating in an active region of a substrate an aligned, three-dimensionally integrated circuit structure having two channel regions responsive to a common gate electrode, comprising the steps of:

forming in the active region of a semiconductor substrate over a first channel defined between first source/drain regions a relatively thick lift-off material layer coextensive with an underlining gate electrode layer, together forming sidewalls at the channel ends;

forming a first dielectrical layer, over the integrated circuit structure, characterized by the presence of an accentuated etchability of the first dielectric layer in the regions covering the sidewalls of the lift-off material layer;

selectively etching first dielectric layer material covering the sidewalls of the lift-off material layer to expose the lift-off material;

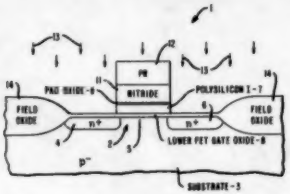
selectively removing the lift-off material and first dielectric formed thereover to form a recess in correspondence with the gate electrode layer;

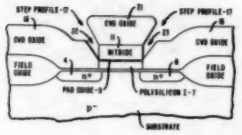
forming a conformal layer of a semiconductor material over the structure to retain a recess in correspondence with the gate electrode layer;

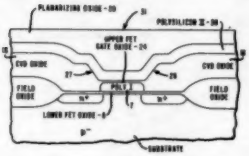
forming a region of dopant masking material in the recess in correspondence with the gate electrode layer; and

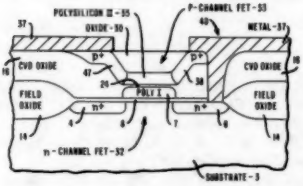
doping the semiconductor material in the presence of the

region of dopant masking material to form in the semiconductor material layer a second channel under the dopant









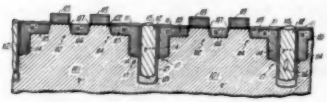
masking region and second source/drain regions outside the dopant masking region.

4,679,300

METHOD OF MAKING A TRENCH CAPACITOR AND DRAM MEMORY CELL

Tsiu C. Chan, Carrollton, and Yu-Pin Han, Dallas, both of Tex., assignors to Thomson Components-Mostek Corp., Carrollton, Tex.

Filed Oct. 7, 1985, Ser. No. 785,195
Int. Cl.[4] H01L *27/10*; H01C *11/24*
U.S. Cl. 29—571 **6 Claims**



1. A method of fabricating a trench capacitor in an integrated circuit containing a plurality of circuit elements formed in a semiconductor substrate having a substrate conductivity type, comprising the steps of:

forming a protective layer on said substrate;

cutting an implant aperture having first and second aperture dimensions along first and second axes in said substrate, in a predetermined location in said substrate dimensions along said first and second axes, through said protective layer to said substrate;

implanting a predetermined dose of ions of conductivity type opposite to said substrate conductivity type;

diffusing said dose of ions into said substrate by heating said substrate to a predetermined temperature for a predetermined time such that a substantial concentration of said ions of said opposite conductivity type extends a predetermined distance from said implant aperture, whereby that portion of said dose of ions extending in said substrate below said predetermined capacitor plate location forms a plate conductive region extending downwardly into said substrate along a third axis and having first, second and third plate dimensions along said first, second and third axes;

cutting a trench into said substrate through said implant aperture, thereby forming a trench wall on that surface of said trench extending into said substrate through said plate conductive region with a wall area having a wall length greater than said first plate dimension along said first axis and a wall depth greater than said third plate dimension along said third axis;

growing a wall layer of silicon dioxide on said trench wall adjacent said plate conductive region and extending along said trench wall beyond said plate conductive region;

filling said trench with polycrystalline silicon filler heavily doped with a trench dopant material of the same conductivity type as said substrate conductivity type and having the capacity of diffusing through thin layers of silicon dioxide; and

heating said substrate to a predetermined temperature for a predetermined time sufficient to diffuse a predetermined quantity of said trench dopant material through said wall layer of silicon dioxide to form a diffused channel stop region disposed about said plate conductive region in that portion of said silicon substrate abutting said trench wall and outside said first and third plate dimensions, whereby a parallel-plate capacitor is formed, one plate of which consists of said conductive plate region and the other plate of which is formed by said heavily doped polycrystalline filler, which capcitor has improved resistance to discharge through the effect of said diffused channel stop region.

4,679,301

PROCESS FOR PRODUCING SILICIDE OR SILICON GATES FOR AN INTEGRATED CIRCUIT HAVING ELEMENTS OF THE GATE-INSULATOR-SEMICONDUCTOR TYPE

Pierre Blanchard, Echirolles, and Jean P. Cortot, Grenoble, both of France, assignors to Thomson-Csf, Paris, France

Filed Sep. 30, 1985, Ser. No. 782,140
Claims priority, application France, Oct. 2, 1984, 84 15125
Int. Cl.[4] H01L *21/283*
U.S. Cl. 29—571 **11 Claims**

1. A process for producing closely spaced gate electrodes on a silicon semiconductive substrate for an integrated circuit comprising:

depositing on the top surface of the substrate successively, layers of silicon oxide, polycrystalline silicon, a metal which can be converted to a silicide, an oxide and a masking material,

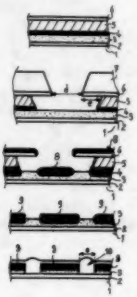
patterning the masking layer to provide openings where there is exposed the underlying oxide layer,

etching the oxide layer isotropically to undercut the masking layer to obtain overhang, thereby exposing portions of the metal layer larger than the openings in the masking layer,

etching the exposed portions of the metal layer, for exposing the underlying polycrystalline silicon,

depositing through the openings in the masking layer a layer

of a metal which can be converted into a silicide on only the central portion of the exposed polycrystalline layer, corresponding essentially to the opening in the masking layer,



annealing the substrate for converting the metal in the portions contacting the polycrystalline layer to silicide, and removing both the layers the silicide portions and the unconverted polycrystalline silicon portions between the silicide portions to define the silicide gates.

4,679,302

DOUBLE POLYSILICON INTEGRATED CIRCUIT PROCESS

Robert E. Theriault, Ottawa, and John G. Hogeboom, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 12, 1986, Ser. No. 861,887
Int. Cl.[4] H01L *27/04, 29/78*
U.S. Cl. 29—571 **7 Claims**

1. A double polysilicon integrated circuit processing method comprising:

(i) taking a silicon wafer;

(ii) forming field oxide regions therein;

(iii) forming a gate oxide layer over a device well region, said device well region having source, gate and capacitor areas;

(iv) depositing a first polysilcon layer over the gate oxide layer;

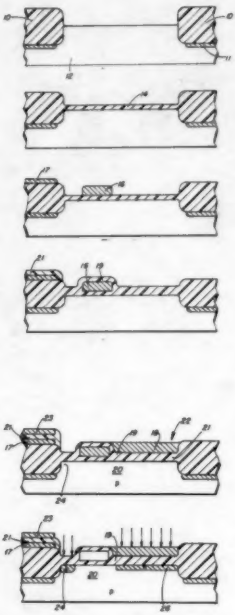
(v) etching the polysilicon to form a transistor gate over said gate area;

(vi) forming a second oxide layer over the gate and the surrounding device region;

(vii) depositing a second polysilicon layer over the second oxide layer;

(viii) etching the second polysilicon layer to leave polysilicon over said capacitor area; and

(ix) in a single implantation step, implanting ions through said second oxide layer into said source area to form a transistor source and through said oxide and second polysilicon layers to define one side of a capacitor at said capacitor area, said second level polysilicon at the capacitor area functioning as an opposed side of the capacitor, and the second oxide layer at the capacitor area functioning as a capacitor dielectric, the junction depth and concentration of ions in the capacitor area being less than the



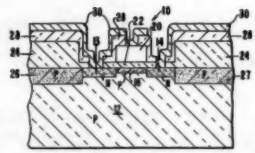
junction depth and concentration of ions in the source area.

4,679,303

METHOD OF FABRICATING HIGH DENSITY MOSFETS WITH FIELD ALIGNED CHANNEL STOPS

John Y. Chen, Los Angeles, and Richard C. Henderson, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 537,920, Sep. 30, 1983, abandoned. This application May 16, 1985, Ser. No. 734,806
Int. Cl.[4] H01L *21/425*
U.S. Cl. 29—571 **10 Claims**



1. A method of fabricating a MOSFET device, comprising a sequence of the following steps:

(a) providing a substrate;

(b) providing a field oxide layer on the surface of said substrate;

(c) forming a patterned first mask over said field oxide layer defining the boundary of an active device area in said substrate;

(d) removing that portion of said oxide layer exposed by said first mask so as to expose said active device area of said

substrate, a resulting edge of said field oxide layer being aligned with a boundary point of said active device area;

(e) doping said exposed active device area to form an active channel region;

(f) providing a second mask layer overlying the surface of said substrate and removing said first mask so as to lift-off the overlying portion of said second mask layer to provide a second mask overlying said active area;

(g) implanting ions into said substrate and masked field oxide at an energy level insufficient fo said ions to penetrate said second mask, but with sufficient energy to pass through said field oxide layer to form a channel stop self aligned to said field oxide layer and correspondingly aligned with said active device area; and

(h) removing said second mask.

4,679,304

PROCESS FOR PRODUCING ZONES FOR THE ELECTRICAL ISOLATION OF THE COMPONENTS OF AN INTEGRATED CIRCUIT

Daniel Bois, Chet BD 98, 38263 Neylam, France

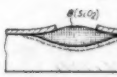
PCT No. PCT/FR85/00066, § 371 Date Nov. 15, 1985, § 102(e) Date Nov. 15, 1985, PCT Pub. No. WO85/04516, PCT Pub. Date Oct. 10, 1985

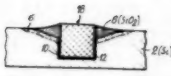
PCT Filed Mar. 29, 1985, Ser. No. 800,617

Claims priority, application France, Mar. 30, 1984, 84 05051

Int. Cl.[4] H01L *21/82, 21/306*

U.S. Cl. 29—576 W **7 Claims**





1. A process for the production of isolation zones for bringing about electrical isolation between the components of an integrated circuit formed on a silicon substrate, comprising the successive stages of:

forming a mask on said substrate in order to define the locations of the isolation zones to be produced;

doping the unmasked substrate regions;

oxidizing thermally said doped substrate regions in order to form a surface isolation;

forming a trench in each oxidized region of the substrate and in the substrate regions positioned below said oxidized regions by etching successively said oxidized regions and the substrate;

oxidizing thermally the edges of said trenches in order to form on said edges an insulting film;

filling said trenches by depositing an isolating dielectric in said trenches in order to form a deep isolation; and

eliminating said mask.

4,679,305

METHOD OF MANUFACTURING A HETEROJUNCTION BIPOLAR TRANSISTOR HAVING SELF-ALIGNED EMITTER AND BASE AND SELECTIVE ISOLATION REGIONS

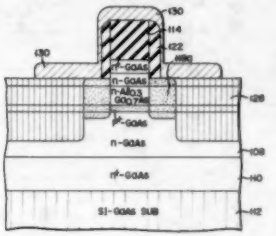
Kouhei Morizuka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

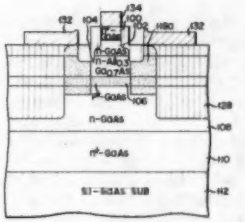
Filed Dec. 18, 1985, Ser. No. 810,300

Claims priority, application Japan, Dec. 21, 1984, 59-268383

Int. Cl.[4] H01L *21/265*

U.S. Cl. 29—576.3 **11 Claims**





1. A method of manufacturing a heterojunction bipolar transistor comprising the steps of:

(a1) forming a first semiconductor layer of a first conductivity type as a collector on a semiconductor substrate;

(a2) forming a second semiconductor layer of a second conductivity type as a base on said first semiconductor layer;

(a3) forming a third semiconductor layer of the first conductivity type as an emitter on said second semiconductor layer, said third and second semiconductor layers constituting a heterojunction;

(a4) selectively forming a first mask on said third semiconductor layer;

(a5) ion-implanting ions of an impurity of the second conductivity type into the resultant structure using a first mask, thereby forming an emitter region and an external base region of the second conductivity type extending to said second semiconductor layer;

(a6) forming a second mask on a side wall of said first mask; and

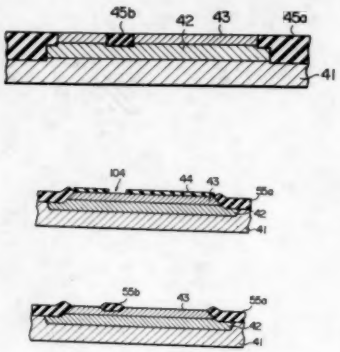
(a7) ion-implanting a predetermined first material into the resultant structure using said first and second masks, thereby forming a high-resistance layer for isolating said external base region, wherein a width of a remaining external base region is defined by a width of said second mask.

4,679,306

SELF-ALIGNED PROCESS FOR FORMING DIELECTRICALLY ISOLATING REGIONS FORMED IN SEMICONDUCTOR DEVICE

Junzoh Shimizu, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 24, 1985, Ser. No. 779,496
Claims priority, application Japan, Sep. 28, 1984, 59-203201
Int. Cl.[4] H01L *21/385*
U.S. Cl. 29—576 W 30 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

(a) forming a first mask film on a semiconductor substrate,

(b) forming a first polycrystalline silicon layer on said first mask film, said first polycrystalline silicon layer being doped with p type impurity atoms,

(c) forming a second mask film on said first polycrystalline silicon layer, said second mask film being formed of the same material as said first mask film and having a different etching nature from that of polycrystalline silicon,

(d) patterning said second mask film and said first polycrystalline silicon layer succesively, thereby retaining first and second portions composed of the second mask film and the first polycrystalline silicon layer,

(e) forming a second polycrystalline silicon layer on exposed parts of said first mask film and said first and second portions, said second polycrystalline silicon layer being undoped or lightly doped with p type impurity atoms,

(f) applying heat treatment to diffuse said p type impurity atoms from said first polycrystalline silicon layer to said second polycrystalline silicon layer, thereby increasing the concentration of the p type impurity atoms in a part of the second polycrystalline silicon layer extending on said first mask film between said first and second portions,

(g) selectively removing a portion of said second polycrystalline silicon layer where said p type impurity atoms are not diffused during said step (f),

(h) selectively removing exposed portions of said first mask film, thereby exposing a portion of said semiconductor substrate,

(i) selectively removing part of the exposed portion of said semiconductor substrate,

(j) removing said remaining second polycrystalline silicon layer and said first mask film between said first and second portions, thereby exposing a portion of said semiconductor substrate between the first and second portions, and

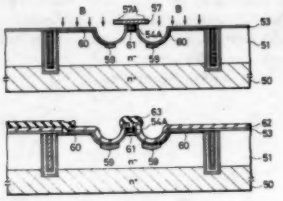
(k) removing the exposed portions of said semiconductor substrate, thereby causing the exposed portions to have different depths from each other.

4,679,307

METHOD OF MANUFACTURING A RECESSED GATE OF A SEMICONDUCTOR DEVICE

István Bársony, Hamamatsu, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,536
Claims priority, application Japan, Oct. 29, 1984, 59-225885
Int. Cl.[4] H01L *21/22, 21/265, 21/302*
U.S. Cl. 29—576 B 5 Claims



1. A method of manufacturing a semiconductor device with a recessed gate structure, the method comprises the steps of:

forming a thin film pattern of a predetermined material on a semiconductor substrate having a predetermined configuration;

selectively etching said semiconductor substrate using said film pattern as an etching mask to form a concave portion in said semiconductor substrate, said concave portion being wider than windows of said film pattern;

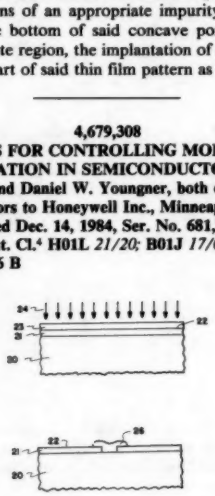
implanting ions of an appropriate impurity into a surface area of the bottom of said concave portion to form a recessed gate region, the implantation of said ions uses at least one part of said thin film pattern as a mask.

4,679,308

PROCESS FOR CONTROLLING MOBILE ION CONTAMINATION IN SEMICONDUCTOR DEVICES

Chris J. Finn, and Daniel W. Youngner, both of Maple Grove, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 14, 1984, Ser. No. 681,768
Int. Cl.[4] H01L *21/20;* B01J *17/00*
U.S. Cl. 29—576 B 18 Claims



1. A process for controlling mobile ion contamination in semiconductor devices comprising the steps of:

forming a layer of a dielectric material on a major surface of a semiconductor body;

forming a layer of an organic material overlying said dielectric material;

implanting a mobile ion gettering agent into said layer of organic material using an implantation energy in a range such that a substantial amount of said gettering agent remains in said layer of organic material;

ashing said layer of organic material in an oxygen based plasma; and

performing subsequent processing steps.

4,679,309

PROCESS FOR MANUFACTURING ISOLATED SEMI CONDUCTOR COMPONENTS IN A SEMI CONDUCTOR WAFER

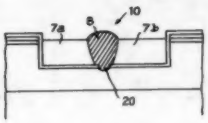
Joseph Borel, St. Egreve, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.-C.I.S., Grenoble, France

Filed Jun. 18, 1984, Ser. No. 621,733

Claims priority, application France, Jun. 21, 1983, 83 10243

Int. Cl.[4] H01L *21/76*

U.S. Cl. 29—576 W **3 Claims**



3. The process as claimed in claim 2, further comprising, after the epitaxying step, the following step;

locally oxidizing said epitaxied polycrystalline silicon layer over the whole of its thickness opposite said windows.

4,679,310

METHOD OF MAKING IMPROVED METAL SILICIDE FUSE FOR INTEGRATED CIRCUIT STRUCTURE

Govardhan Ramachandra, Sunnyvale, and Kiran M. Bhatt, Milpitas, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 31, 1985, Ser. No. 794,216

Int. Cl.[4] H01L *21/90*

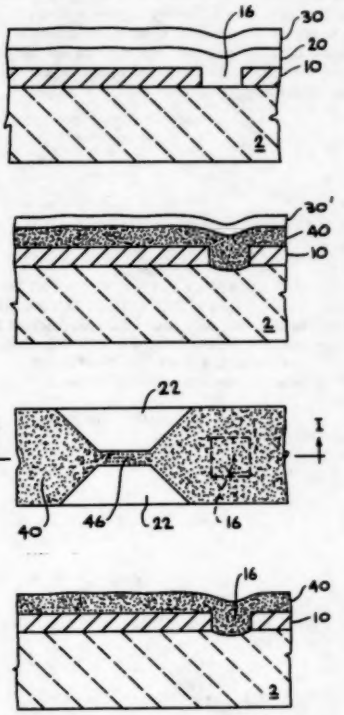
U.S. Cl. 29—577 R **15 Claims**

1. A method of forming an improved metal silicide fuse of controlled thickness on an integrated circuit structure comprising a silicon substrate which comprises:

(a) forming on said underlying silicon substrate a layer of a predetermined amount of a metal capable of reacting with silicon to form a silicide;

(b) forming over said metal a layer of silicon in excess of the amount needed to react with all of said underlying metal;

(c) patterning said silicon layer to form the desired fuse width and length prior to formation of the silicide; and



(d) heating said structure to a temperature sufficient to cause said metal and said patterned silicon to react to form the desired metal silicide.

4,679,311

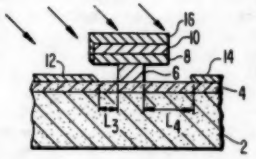
METHOD OF FABRICATING SELF-ALIGNED FIELD-EFFECT TRANSISTOR HAVING T-SHAPED GATE ELECTRODE, SUB-MICRON GATE LENGTH AND VARIABLE DRAIN TO GATE SPACING

Amir A. Lakhani, and Laurence C. Olver, both of Columbia, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 12, 1985, Ser. No. 808,597

Int. Cl.[4] H01L *21/283, 21/308*

U.S. Cl. 29—579 **13 Claims**



1. A method of fabricating a self-aligned semiconductor device on a substrate having an active region formed therein, comprising the steps of:

(a) forming a multi-layer gate structure on the active region, said gate structure having an aluminum layer contacting said active region, a titanium layer disposed on said alumi-

num layer and a platinum layer disposed on said titanium layer;

(b) selectively etching said aluminum layer to form a gate electrode having a T-shaped cross-section; and

(c) forming source and drain electrodes on the active region using the T-shaped gate electrode as a shadow mask so that the source and drain electrodes are aligned with the gate electrode.

4,679,312

METHODS AND APPARATUS FOR THE AUTOMATIC PRODUCTION OF STATORS FOR ELECTRIC MOTORS

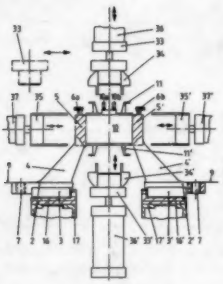
Manfred Nussbaumer, and Bruno Fischer, both of Dietikon, Switzerland, assignors to Micafil AG, Zurich, Switzerland

Filed Feb. 4, 1986, Ser. No. 825,908

Claims priority, application Switzerland, Feb. 15, 1985, 0717/85

Int. Cl.⁴ H02K *15/06*

U.S. Cl. 29—596 **7 Claims**



1. In an apparatus for the production of stators for electric motors, said apparatus being of the type comprising a production line having a plurality of work stations, including a winding station, and conveyor means for advancing stator workpiece holders successively to said stations, the improvement wherein:

said conveyor means comprises a pair of parallel, horizontally spaced belts driven synchronously in horizontally spaced relationship,

each said holder comprising:

jaws for securing a stator workpiece therebetween, and

legs extending generally vertically from said jaws and including bearing surfaces engageable with respective ones of said belts to form a horizontal space between said legs,

said winding station comprising:

upper and lower winding forms arranged to move generally vertically to approach a stator workpiece from above and below, with one of said winding forms arranged to travel between said belts and said legs as it approaches said stator workpiece, and

a pair of winding form holders arranged to move generally horizontally to approach said winding forms from opposite horizontal sides of said workpiece holder, and

retaining means for retaining said stator holders at said stations while continuing to drive said belts so that said stator holders can be advanced independently of one another.

4,679,313

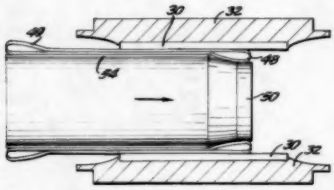
METHOD OF MAKING A SERVO MOTOR WITH HIGH ENERGY PRODUCT MAGNETS

Roy D. Schultz, Radford; Thomas R. England, Blacksburg, and C. Clark Altizor, Radford, all of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Mar. 8, 1985, Ser. No. 709,763

Int. Cl.⁴ H02K *15/06*

U.S. Cl. 29—596 **8 Claims**



1. A method of making an electric motor with the stator winding inside a slotless cylindrical stator shell comprising the steps of:

forming a slotless cylindrical stator shell of magnetic material;

creating a generally cylindrical support with a reduced diameter portion at one end;

forming the winding around said support from preformed coils such that

the coil and turns at one end of said support flare inwardly and extend adjacent said reduced diameter portion, and

the coil end turns at the other end of said support flare outwardly;

inserting said winding into said cylindrical stator shell starting with the inwardly flared end coils while the winding is supported by said support;

impregnating said winding with a resin to secure said winding inside said stator shell; and

removing said support from the winding through said end having said outwardly flared end coils.

4,679,314

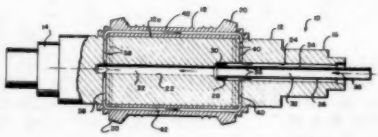
METHOD FOR MAKING A FLUID COOLED ACYCLIC GENERATOR ROTOR

Henry G. Lenz, Scotia; Leonard Coffman, Schenectady, and Adrian M. Beltran, Ballston Spa, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1985, Ser. No. 812,033

Int. Cl.⁴ H02K *15/14*

U.S. Cl. 29—598 **14 Claims**



1. A method for manufacturing a fluid cooled rotor for an acyclic electromagnetic machine comprising the steps of:

A. providing a rotor core of a ferromagnetic steel having a peripheral surface;

B. machining internal passages in said core opening into said core peripheral surface for accommodating the circulation of a coolant;

C. providing a plurality of coolant tubes;

D. fixedly supporting said coolant tubes in spaced relation to said peripheral surface, said tubes being distributed about the periphery of said core;

E. coupling inlet and outlet ends of said tubes in coolant flow connection with said passages at said peripheral surface; and

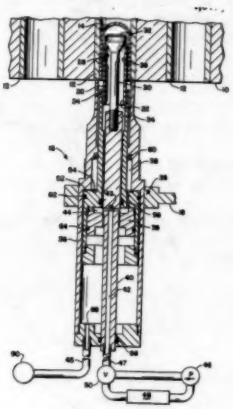
F. forming a current conductor enveloping said tubes and diffusion bonded to said core peripheral surface from a metallic powder by hot isostatic pressure, said passages being vented to the isostatic pressure to prevent collapse of said tubes.

4,679,315

HYDRAULIC TUBE PLUG REMOVER

Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 6, 1986, Ser. No. 816,601
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—726 **3 Claims**



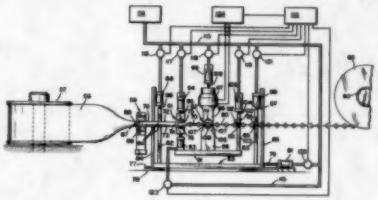
1. In combination, a tube, a plug in the end of the tube, plug removal means including a shaft having an enlarged first end extending up into the plug, expandable means surrounding the enlarged end, such that when the shaft is removed axially outwardly of the plug and the expandable means, it forces the expandable means radially outwardly into tight engagement with plug, a plug removal means actuator including a first member having a first end attached to the shaft, and second end attached to a first piston, a second member having a first end attached to the expandable means and a second end attached to a second piston, a first chamber having one wall thereof, formed by the first piston, a second chamber having one wall thereof formed by the second piston, a source of pressurized fluid, a first passage connecting the source of pressurized fluid with the first chamber, a restricted second passage connecting the first chamber to the second chamber, such that when the source of pressurized fluid is initially connected to the first chamber, the enlarged first end of the shaft is immediately moved axially outwardly of the plug and the expandable means, causing the expandable means move radially outwardly into right engagement with the plug, and as more pressurized fluid enters the first chamber and the second chamber, both and the first and second pistons move to pull the plug removal means and the plug out of the tube.

4,679,316

APPARATUS FOR FORMING AND INSERTING CELL SEPARATOR BASKETS

Robert D. Simonton, Fremont; John D. Cattano, Castalia, and Robert K. Mason, Gibsonburg, all of Ohio, assignors to Fremont Special Machine Co., Inc., Fremont, Ohio

Division of Ser. No. 707,887, Mar. 4, 1985, Pat. No. 4,618,546.
This application May 5, 1986, Ser. No. 859,691
Int. Cl.[4] H01M *2/00*; B23P *19/00*
U.S. Cl. 29—731 **20 Claims**



1. Apparatus for manufacturing a plurality of primary cell separator basket preforms comprising folding means for a strip of separator sheet material, the strip having parallel longitudinal edges and being of a width at least twice the height of the separator basket, said folding means folding the strip longitudinally and parallel to the edges of the strip with the width of the narrowest side of the strip contiguous to the fold at least the height of the separator basket and the length of the strip and the fold greater than a plurality of preform widths of length exceeding one half the perimeter of the separator basket, the folded strip having overlaying strip sides, said folding means including a folding mandrel normal to the path of the plane of the strip and having opposed longitudinal sides and guides closely spaced from said mandrel sides for confining the folded strip panels against the opposed longitudinal mandrel sides; first and second spaced strip clamps mounted for joint reciprocal motion along the path of the folded strip and arranged to grip selectively the outer faces of the strip; recirpocal drive means for said first and second strip clamps; means to actuate said clamps to grip strip and to actuate said reciprocal drive while said clamps grip the strip; and joining means to join the overlaying sides of the folded strip at a plurality of paired bond regions spaced apart generally one half the perimeter of the separator basket and extending continuously from the fold toward and normal to the longitudinal edges of the strip, the paired bonds being spaced along the strip to define preforms having basket bottoms at the fold, an open basket top opposite the fold and closed basket sides between the paired bonds; said reciprocal drive advancing said strip in increments of a length exceeding one half the perimeter of the separator basket plus the width of the paired bond regions longitudinally of the strip and said second clamp being spaced from said joining means downstream of the strip path a multiple of said increments whereby said second clamp grips said strip between basket preforms defined by closed preform walls between paired bonds of the strip.

4,679,317

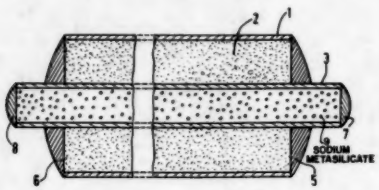
SCREENED CABLE INSULATED BY MEANS OF MINERAL INSULATION MATERIAL AND METHOD OF MANUFACTURING SUCH A CABLE

Gilles Bailleul, Montesson, France, and Tjerk Sannes, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 670,514, Nov. 13, 1984, abandoned.
This application Mar. 28, 1986, Ser. No. 846,506
Claims priority, application France, Nov. 21, 1983, 83 18487
Int. Cl.[4] H01B *13/00*
U.S. Cl. 29—828 **6 Claims**

1. A method of manufacturing a cable insulated with mineral

insulation material and comprising a central electrical conductor unfilled hollow throughout its length, said mineral insulation material provided around said central conductor, a metal sheath surrounding said central electrical conductor and said insulation material, said central conductor extending along the length of said cable, and the ends of said cable being sealed in a moisture-tight manner by means of plugs through which said central conductor passes, said method comprising subjecting a hollow central conductor having a reducible diameter exceeding that of the desired conductor to a mechanical treatment for



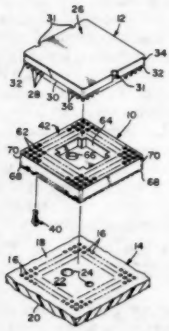
increasing the length of, and thereby reducing the diameter of said conductor having said reducible diameter while being periodically subjected to an annealing treatment characterized in that prior to commencement of said mechanical treatment said hollow conductor having said reducible diameter is filled with a material capable of withstanding the pressure of said mechanical treatment and the temperature of said annealing treatment and said material is removed from said conductor having said reducible diameter when said treatments are terminated and the diameter of said conductor having said reducible diameter has been reduced to the desired value.

4,679,318

APPLICATION TOOL AND METHOD FOR POSITIONING ELECTRICAL SOCKETS ON CIRCUIT BOARDS FOR SURFACE SOLDERING

Edward J. Bright, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 6, 1986, Ser. No. 826,932
Int. Cl.[4] H05K *3/34*; B23P *19/00*
U.S. Cl. 79—840 **8 Claims**



1. A method of positioning an electrical socket on a printed circuit board for subsequent soldering thereto, said socket including a plurality of conductive contact elements disposed in cavities in a dielectric housing with openings to said cavities on opposing surfaces thereof, said contact elements having converging spring arms at one end and positioned adjacent one of said openings and a solder foot at another end and extending outwardly through another of said openings, said method comprising the steps of:

placing said electrical socket on said circuit board with said solder feet resting on or being above solder paste previously deposited on conductive pads on said circuit board;

positioning application tool means on said socket with pins, depending from said tool means, entering said cavities and being received between said spring arms for frictional engagement therewith; and

pushing on said application tool means to move said contact elements towards said circuit board to seat said solder feet in said solder paste.

6. An application tool for use in positioning an electrical socket on a printed circuit board for subsequent soldering thereto, said socket being of the type having contact elements with converging spring arms at one end and a solder foot at another end, said spring arms being accessible through openings on one surface of the socket and said solder foot extending outwardly from another surface of the socket, said application tool comprising:

body means having a spatial area substantially equal to that of said electrical socket and further having post means for engaging a surface of said electrical socket; and

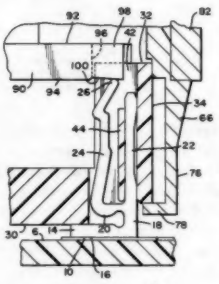
depending pin means on one surface of said body means, said pin means adapted for being frictionally received between said spring arms on said contact elements so that upon pushing on said body means, said contact elements are moved towards said circuit board to seat said solder feet in solder paste deposited on conductive pads on said circuit board with said post means on said body means into said spring arms.

4,679,319

TOOL AND METHOD FOR REMOVING CONNECTOR HOUSINGS FROM TERMINALS MOUNTED ON A SUBSTRATE

Dimitry G. Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 14, 1986, Ser. No. 885,121
Int. Cl.[4] H05K *13/04*
U.S. Cl. 29—843 **18 Claims**



1. A pulling tool of the type comprising a yoke having a central axis, a plurality of pulling arms pivoted to the yoke at spaced angular intervals around the central axis, the arms extending from the yoke beside, and along, the central axis in a first axial direction and being arcuately movable towards and away from the central axis, a reaction member and actuating means for moving the yoke relative to the reaction member in a second axial direction which is the opposite direction of the first axial direction, the tool being intended to remove a housing from a group of terminals which are mounted on a substrate, the terminals being arranged in at least two parallel rows and having terminal end portions which are spaced from the substrate, the housing having a lower face which is parallel to, and opposed to, the substrate and having an upper face which is spaced from the substrate, a recess extending in-

wardly from the upper face towards the lower face, the recess having recess sidewalls which surround the recess and which extend inwardly from the upper face, the housing having terminal receiving cavities which extend inwardly from the recess sidewalls and which extend from the lower face towards the upper face, the terminals being in the cavities, the tool being characterized in that:

the reaction member comprises a reaction plate having parallel major surfaces and circumferential side surfaces which extend normally of the major surfaces, the reaction plate being dimensioned to fit between the rows of terminals,

the pulling arms have free ends, the free ends having housing engaging portions for engagement with the housing, whereby,

upon placing the tool above the housing with the reaction plate between the rows of terminals, thereafter arcuately moving the pulling arms towards the central axis until the housing engaging portions are engaged with the housing, and thereafter moving the yoke relative to the reaction plate in the second axial direction, the housing will be pulled from the terminals.

4,679,320

PROCESS FOR PRODUCING MULTILAYER CERAMIC CIRCUIT BOARD WITH COPPER

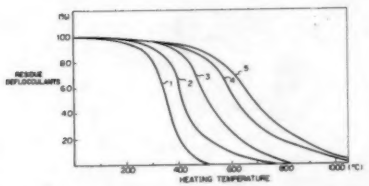
Yoshihiko Imanaka, Atsugi; Hiromi Ogawa, Yokohama; Mineharu Tsukada, Atsugi; Etsuro Udagawa, Atsugi; Kazuaki Kurihara, Atsugi; Hiromitsu Yokoyama, Sagamihara, and Nobuo Kamehara, Isehara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1985, Ser. No. 801,783

Claims priority, application Japan, Dec. 28, 1984, 59-274534

Int. Cl.[4] H01K *3/22*

U.S. Cl. 29—848 **7 Claims**



1. A process for producing a multilayer ceramic circuit board with copper comprising the steps of:

forming green sheets by doctoring a slurry which comprises 100 parts by weight of glass ceramic particles, 5 to 20 parts by weight of a thermally depolymerizable resin binder, 2 to 10 parts by weight of a plasticizer, and up to 2 parts by weight of a fatty acid ethylene oxide adduct type deflocculant, said glass ceramic comprising 20 to 70% by weight of alumina; and 30 to 80% by weight of SiO_2-B_2O_3 type glass;

forming via holes through said green sheets;

screen-printing a copper paste on said green sheets;

laminating said green sheets, thereby forming a multilayer structure; and

firing said multilayer structure in a non-oxidizable atmosphere.

4,679,321

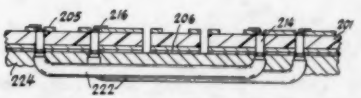
METHOD FOR MAKING COAXIAL INTERCONNECTION BOARDS

J. Philip Plonski, Huntington, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 18, 1985, Ser. No. 788,962

Int. Cl.[4] H01K *3/10*

U.S. Cl. 29—850 **7 Claims**



1. A method of making a coaxial conductor interconnection board having a plurality of coaxial conductors, each conductor of said plurality of coaxial conductors including a signal conductor surrounded by a dielectric in turn surrounded by a conductive shield, comprising the steps of:

drilling holes through the substrate of the board at selected terminal points;

placing a plurality of preformed coaxial conductors on one surface of the substrate;

stripping the end of each conductor of said plurality of preformed coaxial conductors to provide exposed signal conductor sections and exposed dielectric sections;

inserting the stripped ends of the coaxial conductors through said holes at the terminal points so that

the exposed dielectric sections substantially reside in said holes,

the conductive shields are on one side of the board, and

the exposed signal conductor sections are on the other side of the board, and

scribing the coaxial conductors on one surface of the substrate by placing an adhesive coating on the substrate and activating the adhesive upon contact with each coaxial conductor being scribed.

4,679,322

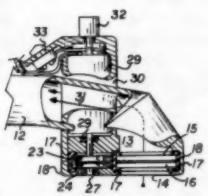
HAIR CLIPPER

Rick E. Hunts, 885 Barsby, Vista, Calif. 92083

Filed Jul. 7, 1986, Ser. No. 882,825

Int. Cl.[4] B26B *19/44*

U.S. Cl. 30—133 **12 Claims**



1. A precision hair clipper for cutting the hair of a subject to a uniform length at a selectable spacing from the subject's scalp which comprises:

a housing defining a flow chamber having an inlet and an outlet connectable to a vacuum source;

a pair of balanced plates, each having a plurality of openings; said plates being slidingly mounted against each other across the inlet;

means for oscillating said plates in opposite phases within their own planes;

wherein the edges of the openings of one plate cooperate with the edges of the opening in the other plate to shear hair drawn into the housing by said vacuum source; and

wherein said openings are shaped and positioned in relation

to one another to maintain a generally constant aperture area therethrough, throughout a complete oscillating cycle of the plates; and

wherein said means for oscillating comprises:

means for maintaining the plate in a linear direction throughout said oscillating cycle; and

said openings in each one of said plates comprise a plurality of parallel and symmetrical slots oriented obliquely in relation to said linear direction of the plates.

4,679,323

ROTARY NIBBLER

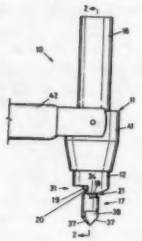
Brian A. Bennett, 53 Morphett Road, Camden Park, South Australia, Australia

Continuation of Ser. No. 669,454, Nov. 7, 1984, Pat. No. 4,593,465. This application Mar. 7, 1986, Ser. No. 837,498

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] B23D *27/02*

U.S. Cl. 30—240 **11 Claims**



1. A rotary nibbler comprising a body, said body having an interior bore defining a generally cylindrical bearing surface having a central axis, a spindle carried in said bore for rotation within said bearing surface of the body about said central axis, a first end of the spindle having a drive engagement surface adjacent one end of the body, a second end of the spindle projecting from the other end of the body and having surfaces defining a helical groove in the side wall of the spindle, one of said groove surfaces defining, with that side wall, a helical cutting edge, said body also having a flat workpiece engagement face which defines, with the axis of rotation, an angle which approximates the helix angle of the groove, said cylindrical bearing surface having an end portion opening to the workpiece engagement face and defining therewith a cutting edge unitary with said body and cooperable with said helical cutting edge upon rotation of the spindle.

4,679,324

SAFETY RAZOR BLADES

Bryan R. Kirk, Basingstoke, England, assignor to The Gillette Company, Boston, Mass.

Filed Nov. 7, 1985, Ser. No. 795,969

Claims priority, application United Kingdom, Nov. 15, 1984, 8428921

Int. Cl.[4] B26B *21/54, 21/06*

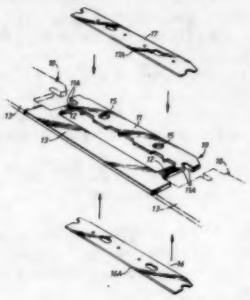
U.S. Cl. 30—346.58 **6 Claims**

1. A razor blade unit, for use on the head of a safety razor comprising a razor blade having a sharpened blade edge, and a carrier for said razor blade, said carrier comprising:

a base portion substantially along the entire length of said sharpened blade edge and permanently secured to a surface of said blade;

an edge-protecting bar positioned in front of said sharpened blade edge; and

frangible connecting means including a first narrow finger projecting from said base portion integrally connecting said bar to said base portion, whereby said edge-protecting bar is separated from said base portion prior to use of said sharpened blade edge.



4,679,325

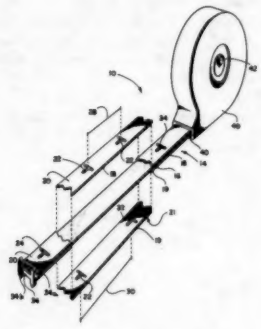
CHALK LINE MARKING DEVICE

Bobby Sweatman, Rte. 12, Box 737 Crow Rd., Cumming, Ga. 30130

Filed Apr. 16, 1986, Ser. No. 852,814

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—138 **12 Claims**



1. An extensible tape for placing chalk marks on a workpiece at regularly spaced intervals, comprising:

a first layer of porous material receptive to chalk; and

a second layer having a smooth surface substantially non-receptive to chalk, said second layer overlying one face of said first layer, said second layer having holes therein at regularly spaced intervals through which the underlying portions of said first layer are exposed;

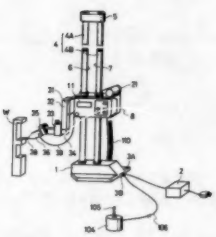
whereby when said tape is brought into contact with a body of chalk, said portions of said first layer exposed through said holes receive particles of said chalk, and said smooth second layer is non-receptive to said chalk, such that when said chalked tape is extended across a surface of said workpiece with said second layer imposed against said workpiece surface, chalk is transferred from said portions of said chalk-receptive first layer exposed through said holes in said second layer onto said workpiece to provide chalk marks at said regularly spaced intervals.

4,679,326

HEIGHT GAUGE

Kinji Takizawa; Ichiro Mizuno, and Iwao Sugizaki, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,523
Claims priority, application Japan, Nov. 21, 1984, 59-246552; Nov. 21, 1984, 59-177050[U]
Int. Cl.[4] G01B 5/02
U.S. Cl. 33—170 12 Claims



1. In a height gauge having a slider vertically movably mounted on a support provided on a base, measuring means for detecting the amount of relative movement between said slider and said support, and a digital indicator for digitally indicating a measured value obtained on the basis of an output from said measuring means,

the improvement comprising:

a driving system engaged with both said slider and said support for automatically and vertically moving said slider along said support, said driving system including a transmission mechanism which comprises a driving shaft rotatably mounted in said slider and having a pinion which engages with a rack formed on said support, said driving shaft being formed thereon with a hollow portion along the central axis thereof and a groove formed in parallel with said hollow portion, a pulley rotatably mounted on said driving shaft, a motor provided on said slider which rotates said pulley by way of a belt, a control wheel rotatably mounted on said driving shaft, and a shifting member which is axially movably provided on said driving shaft between said pulley and said control wheel, said shifting member being rotatable synchronously with said driving shaft;

means for changing said shifting member in its position on said driving shaft so that said shifting member is selectively engaged with said pulley or said control wheel, said means for changing including a changeover knob having a movable element axially movably provided within said hollow portion and a pin extending through said groove so as to interconnect said movable element and said shifting member;

a detector provided on said slider, said detector including a measuring element tiltable in the longitudinal direction of said support, and said detector generating a signal when said measuring element comes into registration with an object to be measured; and

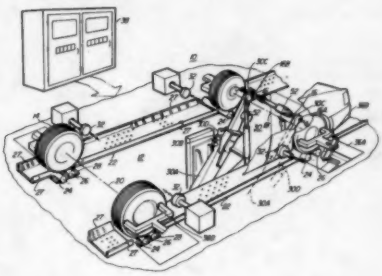
a control circuit which stops the operation of said driving system on the basis of the signal generated by said detector and holds the indication of a measured value being displayed by said digital indicator at that time.

4,679,327

FRONT WHEEL DRIVE VEHICLE, AUTOMATIC TOE SET ALIGNMENT SYSTEM, THEREFOR

John W. Fouchey, Sterling Heights, and Thomas E. Chamberlain, Garden City, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 7, 1986, Ser. No. 882,565
Int. Cl.[4] G01B 5/255
U.S. Cl. 33—203.13 3 Claims



1. A method of measuring an adjusting in and automatic toe set alignment system, toe angles of a left front wheel and a right front wheel associated with a steerable front axle of a motor vehicle, said steerable front axle being steered by a steering wheel within the vehicle, said system being of the type wherein said alignment system has a reference center line oriented in a chosen direction, wherein said right front wheel has a first tie rod for aligning the toe angle of said right front wheel and a second tie rod for aligning the toe angle of said left front wheel, and wherein a right rear wheel and a left rear wheel are mounted to a non-steerable rear axle, which method comprises:

a. orienting the direction of a center line of said vehicle to be in alignment with said reference line of said system;

b. positioning said steering wheel of said vehicle so that a pair of spokes of said steering wheel are oriented to be perpendicular to said reference center line of said system;

c. obtaining acceptable camber angle values;

d. rotating said front and rear wheels about said front and rear axles, respectively, over a predetermined angular path to obtain a run-out compensation value for each of said wheels, the run-out compensation values providing data indicative of high points and depressions of a side wall surface of said wheels;

e. storing said run-out compensation values;

f. measuring to obtain values of a static toe angle of each of said wheels;

g. storing each of said static toe angle values;

h. by using static toe angle measurements of said rear wheels, obtaining a thrust angle value of said rear axle with respect to said reference center line of said system;

i. storing said thrust angle;

j. utilizing said stored run-out compensation values and said thrust angle value to modify said static toe angle value of said front wheels to obtain a corrected toe angle of each of said front wheels;

k. positioning a pair of programmable tie rod adjustment heads about said tie rods so as to be in alignment to adjust said first and said second tie rods;

l. programming said tie rod adjustment heads so as to adjust said tie rods of said front wheel to bring said front wheel toe angles in conformance with said corrected toe angle of each of said front wheels;

m. retracting said tie rod adjustment heads from said tie rods;

n. positioning a pair of programmable nut runners so as to be in alignment for adjusting a jam nut for said first and another jam nut for said second tie rods; and

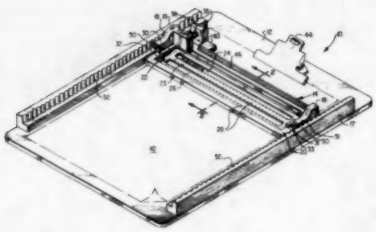
o. programming said nut runners so as to torque said jam nuts a predetermined torque value so as to fix said front wheels in toe angle planes that conform to said corrected toe angle values.

4,679,328

LETTERING TEMPLATE

Michael Saad, 1600 Windermere Dr., Arlington, Tex. 76014

Filed Jun. 11, 1986, Ser. No. 872,811
Int. Cl.[4] B43L *13/02*
U.S. Cl. 33—447 **9 Claims**



1. A writing template for facilitating a generation of uppercase and lowercase letters by a user holding a writing member upon writing material with both primary and secondary rectilinear motion of said template, said template comprising:

a planar substrate adapted for receiving said writing material thereupon;

a slotted member disposed upon said substrate, having at least one slot and borders formed therearound for defining the area of writing with said writing member and adapted for rectilinear movement above said writing material;

means for mounting said slotted member upon said substrate, above said writing material and permitting a primary rectilinear movement thereof in a plurality of parallel spaced steps along said substrate; and

means associated with said slotted member for moving said slotted member in a secondary rectilinear movement a select, incremental distance upon said writing material for permitting the formation of lowercase letters;

said moving means for said secondary rectilinear movement comprising a depression arm coupled to said slotted member; and

said depression arm constructed with an area for receiving engagement of and pressure from a hand of the user to impart said secondary rectilinear movement said incremental distance and define said borders of said slot for said writing member in the generation of said lowercase letters.

4,679,329

COMBINED PRIMARY AND SECONDARY SINE BARS

Wesley R. Goldsmith, 3383 Moore St., Mar Vista, Calif. 90066, and Joel E. Di Marco, 4288 Revere Pl., Culver City, Calif. 90230

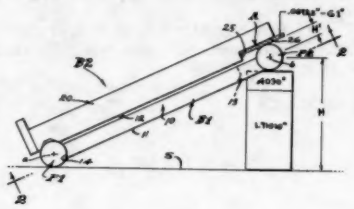
Filed Aug. 4, 1986, Ser. No. 892,259
Int. Cl.[4] G01B *3/56*
U.S. Cl. 33—538 **26 Claims**

1. In combination;

a primary sine-bar comprised of a base plug for support upon a true surface and an altitude plug for support offset from said true surface, the plugs being held on spaced parallel axes by a bar member extending therebetween,

a secondary sine-bar comprised of a bar member coextensively overlying the primary sine-bar with one end having direct supported engagement upon the base plug of the primary sine-bar and its other end overlying the altitude plug of the primary sine-bar,

and adjustment means disposed between the altitude plug and the overlying end of the secondary sine-bar to adjust



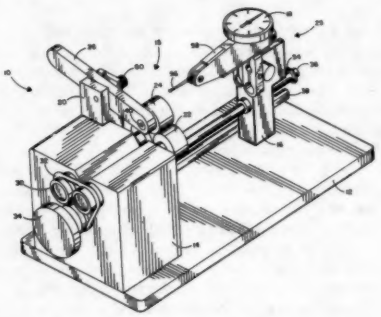
a height established by support of the altitude plug offset from said true surface.

4,679,330

CONCENTRICITY GAUGE

Kenneth L. Williams, 3060 Country Club Dr., Costa Mesa, Calif. 92626

Filed Dec. 12, 1985, Ser. No. 808,037
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—550 **7 Claims**



1. An apparatus for measuring the concentricity of a workpiece, the apparatus of the type having a workpiece support portion for rotationally supporting a workpiece and having a gauge support portion for positioning a probe and gauge relative to the workpiece, the apparatus comprising:

a workpiece support portion having at least one driven roller and at least one idler roller for retaining and rotating said workpiece;

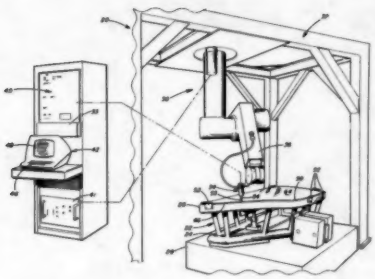
a gauge support portion having means for adjustment of said probe in at least two directions relative to said workpiece for contacting said probe to said workpiece, and having means for positioning said probe away from said workpiece for gaining access to said workpiece without disturbing said adjustment of said probe for the next workpiece, and

a pair of parallel shafts extending from said workpiece support portion, one of said shafts extending into said gauge support portion for controlling the path of travel between said probe and said workpiece, the other of said shafts being adapted for selective engagement with said gauge supporting portion for holding said probe at a selected position relative to said workpiece, said gauge support portion being rotatable about the axis of said one of said shafts.

4,679,331
APPARATUS AND METHOD FOR DETERMINING CONTOUR CHARACTERISTICS OF A CONTOURED ARTICLE

Harry S. Koontz, Penn Hill, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 768,384
Int. Cl.[1] G01B 7/28
U.S. Cl. 33—551 14 Claims

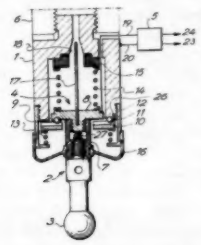


1. An apparatus for determining contour characteristics of a shaped article, comprising:
a supporting surface;
first means for determining contour of said supporting surface;
first means responsive to said first determining means for generating position reference points and reference values;
second means for determining contour of an article while supported on said supporting surface;
second means responsive to said second determining means and said first generating means for generating a thickness value for each position reference point; and
third means responsive to said first and second generating means for determining contour characteristics of the shaped article.

4,679,332
SENSOR DEVICE FOR A MACHINE FOR MEASURING CONDUCTIVE PARTS MOUNTED ON A MEASUREMENT TABLE

Walter Lüthi, Ebnat-Kappel, Switzerland, assignor to Tesa S.A., Renens, Switzerland

Filed Sep. 22, 1986, Ser. No. 910,131
Claims priority, application Switzerland, Oct. 14, 1985, 04415/85
Int. Cl.[4] G01B 7/28
U.S. Cl. 33—559 5 Claims

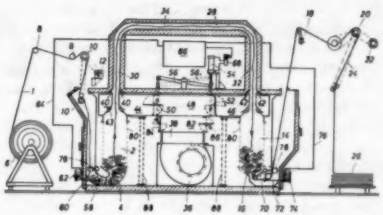


1. A sensor device for a machine for measuring conductive parts mounted on a measurement table and comprising a housing intended to be fastened to a movable support of the machine, a measurement tip sensor integral with the housing and intended to sense a part to be measured by displacement of the movable support, a mechanism for the three-dimensional linking of the sensor to the housing and capable of being deformed elastically when a given pressure of the tip of the sensor against the part to be measured is exceeded and an electric circuit influenced by contact of the tip of the sensor against the part to be measured so as to produce an electric pulse, characterized by the fact that the electric circuit (5) comprises a capacitive amplifier (25) which is connected to the tip (3) of the sensor (2) in order to precharge the latter to a given voltage and has electronic means (28, 29) sensitive to a displacement of charge between the tip of the sensor and the part to be measured so as to produce an electric measurement pulse which is indicative of the entrance into contact of the tip of the sensor with the part to be measured, an insulation of the part to be measured with respect to the measurement table, and a safety arrangement (17, 18) which is sensitive to the elastic deformation of the linkage mechanism so as to produce an electric safety pulse indicating a possible elastic deformation of said mechanism.

4,679,333
APPARATUS FOR THE DRY TREATMENT OF A FABRIC

Jaime A. Vinas, Barcelona 23, La Llagosta (Prov. of Barcelona), Spain

Filed Nov. 8, 1985, Ser. No. 796,605
Int. Cl.[4] F26B 13/12
U.S. Cl. 34—155 7 Claims



1. An apparatus for the dry treatment of a fabric, comprising first and second chambers adapted to contain respective piles of open width fabric, said first chamber being for an inlet pile and said second chamber for an outlet pile; means for providing gradual supply of the fabric into said first chamber; means for providing a gradual removal of the fabric from said second chamber; a flattened section duct for containing the open width fabric and having ends which connect said first and second chambers; movable means situated at least partly in each chamber, adapted to be moved by the fabric on exhaustion of the respective pile; blower means for blowing air into said duct and transporting the fabric contained therein; heating elements disposed downstream of said blower means in the direction of said air to heat said air; slot means in each of the ends of said duct for allowing the ingress of air into the duct; gate means adapted to regulate alternately the direction of air flow towards one or the other slot means; drive means for said gate means, closing one of said gate means while opening the other of said gate means; and connecting means associating the movement of said movable means with said drive means so that upon the movable means sensing the exhaustion of a pile of fabric the drive means reverses the flow of air so as to reverse the direction of transport of the fabric.

4,679,334

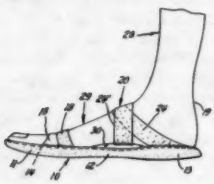
FOOTWEAR HEEL-LOCK SUPPORT STRAPPING SYSTEM

Frank McBride, 631 Chicago Blvd., Detroit, Mich. 48202

Continuation-in-part of Ser. No. 820,806, Jan. 20, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 938,232

Int. Cl.[4] A43B *3/12, 5/06*

U.S. Cl. 36—114 **5 Claims**



1. In an article of footwear, adapted for application to the foot of a wearer, and having a heel end portion, a heel-lock support strapping system comprising:

(a) a heel support strap disposed at the heel end portion of the footwear and having a first end portion extended upwardly and forwardly at an acute angle from the longitudinal plane of the footwear from one side of the heel end portion of the footwear, and having a second end portion extended upwardly and forwardly at an acute angle from the longitudinal plane of the footwear from the other side of the heel end portion of the footwear;

(b) means for anchoring the heel support strap to the article of footwear at the heel end portion of the footwear;

(c) said second end portion of the heel support strap being longer than said first end portion, and being adapted to be wound over the base of the instep of the foot of a wearer of the article of footwear, and thence directly downward and under the arch of said foot and back upwardly over said base of the instep, and thence rearwardly and downwardly at an acute angle from the longitudinal plane of the footwear to a fastening position with said first end portion of the heel support strap to form a figure eight to create a force to pull the rear portion of the foot of said wearer downward and backward into a steadfast engagement with the footwear to provide a positive rear-foot control, while allowing the achilles tendon to function freely from any restrictive strap pressure; and,

(d) fastening means for securing said second end portion of the heel support strap to said first end portion.

4,679,335

VENTED BICYCLE SHOE

Remo Berlese, 31036 Ospedaletto di Istrana, Treviso, Italy

Filed Oct. 22, 1985, Ser. No. 790,109

Int. Cl.[4] A43B *5/14*

U.S. Cl. 36—131 **8 Claims**

1. A bicycle shoe, comprising:

a base section having an exterior portion for engaging a bicycle pedal and an interior portion bearing the underside of the wearer's foot,

an upper section attached to the base section and enclosing the wearer's foot,

a plurality of spaced air scoops at the front of the shoe aligned with the base section, the air scoops being adapted to receive an intake of air in response to forward motion of the shoe, and

a plurality of spaced channels extending along the interior portion of the base section from respective air scoops at the front of the shoe toward the rear of the shoe, said channels venting to the interior of the shoe, the air scoops comprising the forward ends of respective channels, and the depths of the channels being increased at their forward ends to provide the air scoops with greater intake areas

than the channels, and thereby increase the flow rate of air through the channels.

4,679,336

EARTH MOVING MACHINE

Norman Brocklebank, Beverley, and Alan Cooper, Stoke on Trent, both of United Kingdom, assignors to J. C. Bamford Excavators Limited, Rocester, United Kingdom

Filed Nov. 27, 1985, Ser. No. 802,719

Claims priority, application United Kingdom, Dec. 1, 1984, 8430389

Int. Cl.[4] E02F *5/02*

U.S. Cl. 37—103 **14 Claims**

1. A machine comprising a body having a ground engaging propulsion means, a base frame, means mounting the base frame on the ground engaging propulsion means for movement relative to the ground engaging propulsion means about a first generally vertical axis, a boom extending outwardly of the body, means mounting the boom on the base frame for movement about a second axis transverse to the first axis, a dipper arm, means mounting the dipper arm at an outer end of the boom for movement about a third axis also transverse to the first vertical axis, an implement, means mounting the implement at an outer end of the dipper arm for movement about a fourth axis, also generally transverse relative to the first vertical axis, a cable, means securing the cable to the dipper arm, a winch means, means connecting the cable to the winch means to enable movement of the dipper arm relative to the boom and hence to effect movement of the implement towards the body, a hydraulic ram, means mounting the hydraulic ram between the dipper arm and the boom to effect movement of the dipper arm relative to the boom and hence to effect movement of the implement at least away from the body, a counterweight, means mounting the counterweight on the base frame, and means for moving the counterweight towards and away from the first vertical axis in response to movement of the centre of gravity of the machine.

4,679,337

MATERIAL WORKING MACHINE WITH VIBRATING TOOL CARRIER

Frederick A. Carternock, Seabrook Hythe, and Jack S. Knackstedt, London, both of England, assignors to Jaromir Vaclav Drazil, Buckinghamshire, England

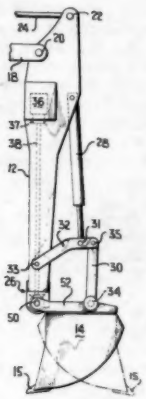
PCT No. PCT/GB84/00391, § 371 Date Jul. 29, 1985, § 102(e) Date Jul. 29, 1985, PCT Pub. No. WO85/02427, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 12, 1984, Ser. No. 761,110

Claims priority, application South Africa, Nov. 29, 1983, 83/8903

Int. Cl.[4] E02F *3/42, 3/84*

U.S. Cl. 37—118 R **14 Claims**



1. A material working machine comprising vibratory means driven by driving means, and non-vibratory means, and including vibratory tool carrier means including attachment means for removable attachment, to the tool carrier means, of a working tool or working tool unit, the tool carrier means incorporating first mounting means for its connection to the vibratory means, and second mounting means for its connection to the non-vibratory means, the second mounting means enabling reciprocation of the tool carrier means at the point of its attachment to the second mounting means when the vibratory means is in operation, the first and second mounting means being spaced from each other in, or substantially in, the direction of said reciprocation, and said tool carrier means incorporates at least one oil reservoir means fluidically connected between the first and second mounting means for supplying oil to both said first and second mounting means.

4,679,338

SNOW REMOVAL SYSTEM WITH ADJUSTABLE SNOW IMPELLER GATE

Carlisle A. Middleton, 38 Dungarrie Rd., Baltimore, Md. 21228

Continuation-in-part of Ser. No. 764,712, Aug. 12, 1985, Pat. No. 4,597,203. This application Jun. 27, 1986, Ser. No. 879,254

Int. Cl.[4] E01H *5/00*

U.S. Cl. 37—244 **9 Claims**

1. In a system for removing material such as snow accumulated to a height on a surface, the system including:

a frame,

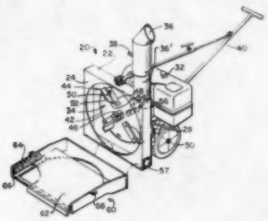
a means for powering said system attached at said frame,

a plurality of wheels supporting the frame,

a housing supported at the frame and defining an intake opening therein and defining a discharge opening, and

means at the housing for intaking said material through the intake opening and discharging said material through the discharge opening, the improvement comprising:

means for maximizing efficiency of said removal of material, including: the intake opening extending substantially upward from a lower portion thereof adjacent a said surface, means for adjusting the upward extent of said intake opening to coincide with said height of material on a surface,



the means for adjusting comprising: a transition member, means for detachably attaching the transition member to the housing at said intake opening, means on the transition member for guiding, and a plate vertically movable on said means for guiding.

4,679,339

PRICE CASSETTE

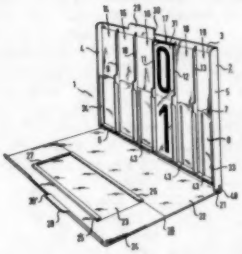
Norbert Hetzer, Lobbach, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed May 9, 1985, Ser. No. 732,262

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421505

Int. Cl.[4] G09F *3/18*

U.S. Cl. 40—10 R **5 Claims**



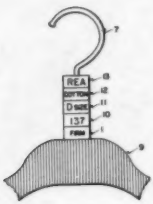
1. Price cassette comprising a moulding in which a plurality of parallel wells at least partially open towards the cassette front side and separated from each other by webs are disposed for receiving price and/or information tags, and a cover which is connected to the moulding and adapted to be placed against the cassette front side for covering the wells, the cover having transparent window areas through which the price and/or information tags can be read, characterized in that the wells (**14, 15, 16, 17, 18, 19**) at the moulding (**2**) are open over their entire length towards the cassette front side and that the webs (**9, 10, 11, 12, 13**) between the wells (**14, 15, 16, 17, 18, 19**) each include an arrowhead shaped edge along at least a portion of their front faces (**32**) facing the cassette front side so that (a) said price and/or information tags can be inserted from the cassette front side into the parallel wells, the insertion being facilitated by the inclined faces of the arrow shaped head whereby the tags buckle along their length as they are inserted and (b) the tags once inserted are held in place in the wells by the arrow shaped edges.

4,679,340

CLOTHING DATA MARKER

Gert A. Johansson, P.O. Box 158, 443 01 Lerum, Sweden

Filed Mar. 8, 1985, Ser. No. 709,733
Int. Cl.[4] G09F 3/00
U.S. Cl. 40—322 **5 Claims**



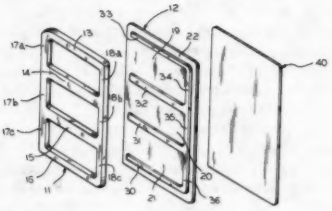
1. A marker adapted to fit onto a hook of a clothes hanger to convey information concerning a garment hung from the clothes hanger, said marker comprising a thin cylindrical ring wall extending longitudinally in the direction of the hook and defining a central traversing hole adapted to receive said clothes hanger hook, the outer surface of said ring wall bearing said information, a radial slot opening within said wall extending over the entire longitudinal length thereof, said slot having a width allowing passage laterally of said hook through said slot for mounting of said marker to said clothes hanger hook, a pair of barbs extending radially inwardly from the inner periphery of said ring wall and positioned to respective sides of said slot and having pointed, wedged ends directed inwardly towards the center of the ring, and having opposed surfaces converging towards each other to form a converging passage having at its inner end a width less than the diameter of said clothes hanger hook, and wherein at least said pair of barbs is formed of a resilient material, such that the clothes hanger hook in pushing through said slot and said passage, deflects the barbs away from each other to permit entry of the hook into the center of the cylindrical ring but said barbs prevent said hanger hook from exiting the slot absent deformation or destruction of at least one of said barbs, and wherein said marker further comprises a plurality of hook locating lugs extending from the inner periphery of the ring wall towards the center of the cylindrical ring wall, at circumferentially spaced positions and to respective sides of said pair of barbs, such that said lugs act jointly with said pair of barbs to center said cylindrical ring wall on said clothes hanger hook.

4,679,341

MODULAR DISPLAY APPARATUS FOR SIGN PANELS

John G. Goldman, Northbrook, Ill., assignor to Mercury Plastics, Inc., Chicago, Ill.

Filed Feb. 6, 1985, Ser. No. 698,570
Int. Cl.[4] G09F 7/02
U.S. Cl. 40—611 **15 Claims**



1. A modular display apparatus for slidably receiving, supporting, maintaining and, displaying from a front side thereof, one or more substantially flat multi-sided signage panels in a desired orientation, said apparatus comprising;

one or more substantially flat panel support means for positioning behind corresponding ones of said one or more substantially flat signage panels,

each of said one or more substantially flat panel support means being of a size substantially equivalent to that of said respective flat signage panel positioned in front thereof,

a plurality of elevated panel ridge means operably emanating from said substantially flat panel support means so as to emanate forwardly therefrom,

said plurality of elevated panel ridge means positioned to closely follow the outer peripheral shape of said respective signage panel so as to substantially abut and surround all but one of said multitude of signage panel sides,

said forwardly emanating portions of said plurality of elevated panel ridge means supporting said respective signage panel along a bottom portion of said signage panel and serving to restrain the position of said respective signage panel positioned therewithin, in a position juxtaposed to said respective panel support means, about all but said one non-abutted side through which slidable reciprocating movement of said signage panel into and out of abutment with said plurality of elevated panel ridge means, is accommodated so as to substantially encircle said signage panel except along said non-abutted side,

overlay frame means operably affixable over said substantially flat panel support means, said plurality of elevated panel ridge means, and a peripheral portion of said signage panel, to further restrainably affix and border each one of said one or more signage panels in place against respective ones of said flat panel support means and within respective ones of said abutting elevated panel ridge means, said overlay frame means describing a series of panel aperture means, each aperture means being operably aligned with a respective one of said one or more signage panels so as to operably display indicia borne thereby, through said panel aperture means,

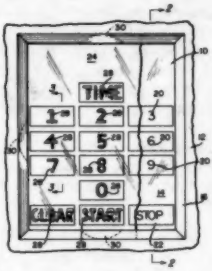
said overlay frame means further comprising a series of overlay struts framing each said panel aperture means, each of said overlay struts being of a substantially inverted U-shaped construction having inner and outer peripheral edges and having a front face at the top of said inverted U-shaped construction,

each of said overlay struts being in respective operable alignment with each of said plurality of elevated panel ridges so as to telescopically nest thereover, while respectively framing all peripheral sides of each signage panel positioned therewithin and recessing each said signage panel back from the front face of said struts and against said panel support means;

said overlay frame means further creating, at the location of said non-abutted side at which position no elevated panel ridge means occurs, slot insert means formed between said substantially flat panel support means at said location and said corresponding overlay strut positioned thereover, to accommodate insertion, removal and restraint of said signage panel into and from said desired orientation for display, said slot insert means providing access to said signage panel at said non-abutted side between said overlay frame means and said flat panel support means without removal of said overlay frame means in front of said signage panel and without removal or penetration of said flat panel support means behind said signage panel, with said signage panel restrainably interposed between said panel support means along its rear surface, the inner peripheral edges of said overlay struts of said overlay frame means about its periphery at its front surface, and said elevated panel ridge means abutting all but one of said signage panel peripheral sides; and

said overlay frame means being restrainably affixed to one or more of said elevated panel ridge means and said panel support means by overlay attachment means.

4,679,342
MEANS FOR RENDERING CONTROLS TACTUALLY-SENSITIVE
Donna Wilson, Village Green, Building 15, Apt. 89, Hazlet, N.J. 07730
Filed Dec. 2, 1985, Ser. No. 803,236
Int. Cl.[4] G09F *18/00*
U.S. Cl. 40—616 **6 Claims**



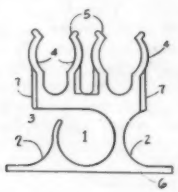
1. For a control panel of a given configuration comprising a given area, and having discrete, and only visually-sensitive or visually-discriminatory controls set out thereon in a prescribed pattern of lettered words and Arabic numerals, means for rendering said words and numerals tactually-sensitive or tactually-discriminatory, comprising:

a sheet having a configuration substantially identical to said given configuration, and encompassing at least an area equal to said given area;

said sheet having discrete, tactually-sensitive or tactually-discriminatory indicia thereon in said same prescribed pattern; and

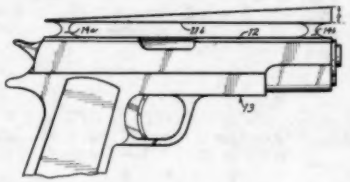
said sheet further having means for emplacement thereof upon said control panel and surmountingly over said visually-sensitive controls; wherein said indicia literally correspond to said words and said numerals.

4,679,343
4 PLUS DOUBLE LOADER
James B. Gomez Harlow, 7560 E. Juniper Dr., Tucson, Ariz. 85730
Filed Feb. 14, 1986, Ser. No. 830,322
Int. Cl.[4] F41C *27/00*; F42B *39/00*
U.S. Cl. 42—87 **1 Claim**



1. An integral one-piece molded plastic loading device for double barreled firearms comprising: a universal ring member, a plurality of shell holders, and a stabilizer bar; said ring member having an open segment therein for adjustably fitting about a user's middle finger; said shell holders being positioned on the back side of a user's hand and having guide lips for the acceptance and guiding of shells therein, and said stabilizer bar extending across the inside of said user's hand to prevent tilting of said device during loading of the firearm.

4,679,344
GUN SIGHT
Thomas A. Jolly, 352 Loma Vista, El Segundo, Calif. 90245
Continuation-in-part of Ser. No. 664,611, Oct. 25, 1984, Pat. No. 4,601,121. This application Jul. 21, 1986, Ser. No. 888,589
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] F41G *1/00*
U.S. Cl. 42—100 **4 Claims**



1. A gun sight for mounting on a gun having a muzzle, barrel and top surface, said sight comprising:

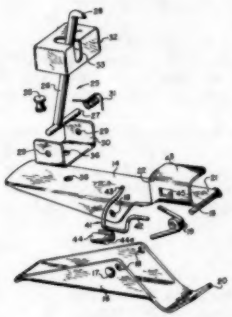
a base portion attached to the top surface of said gun;

a top portion in the form of an elongated ellipse, said top portion rising linearly towards the muzzle of the gun;

said top portion rising a distance substantially equal to the minor axis of said ellipse;

whereby when a target is sighted along said top portion of the sight, the gun is properly aimed when a circle centered on the target appears in the sight.

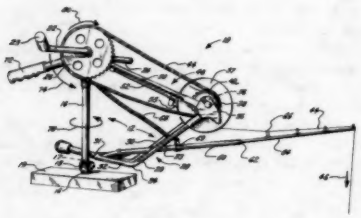
4,679,345
FISHING LINE STRIKE INDICATOR
Dwayne A. Hall, 918 Cherry Dr., Schaumburg, Ill. 60194
Filed Apr. 16, 1986, Ser. No. 852,747
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 **5 Claims**



1. An improved fishing line signalling device providing strike indication, comprising in combination: clamping means including in assembly a pair of elongated bar members pivotably connected off-center of and along the length dimensions thereof, and being biased to move together along an aligned end portion thereof to provide a clamping end portion for attachment of the signalling device, pivotable spring-biased signalling arm means to be pivotably connected to a selected bar member for movement about a vertical axis to provide horizontal displacement of the signalling arm means, and to be pivotably connected for movement about a horizontal axis to provide vertical displacement of the signalling arm means in the direction of the spring-bias, the spring-bias moving the signalling arm means responsive thereto to a released signalling

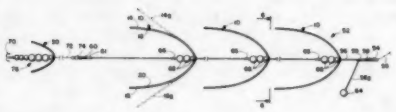
position thereof, said signalling arm means having a free-end portion thereof movable against said spring-bias and into engagement with a perpendicularly extended fishing line with movement thereof to a set non-signalling position thereof, and having the free-end portion thereof movable horizontally by the engaging fishing line about the vertical axis of the signalling arm means with forward line movements of the fishing line, to provide release of the signalling arm means to the released signalling position thereof, and secondary clamping means movable into engagement with the fishing line for providing restraint against free line movement while allowing forward line movement thereof, and being moved by the signalling arm means from engagement with the fishing line with movement of the signalling arm means to the released signalling position thereof.

4,679,346
FISHING APPARATUS
Albert Angelety, Sr., 2512½ Pauger St., New Orleans, La. 70116
Filed Aug. 12, 1985, Ser. No. 764,548
Int. Cl.[4] A01K *89/00*
U.S. Cl. 43—20 **10 Claims**



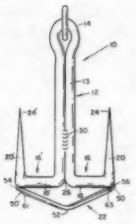
1. An improved fishing apparatus, comprising:
a. a frame;
b. a primary sprocket rotatably on the frame, the primary sprocket further including a pair of handle members for manually imparting rotation to the primary sprocket;
c. a spool containing fishing line rotatably mounted on the frame;
d. means for interconnecting the sprocket and the spool so that rotation of the sprocket imparts rotation to the spool;
e. a flexible pole member mounted on the frame for housing a length of fishing line from the rotatably mounted spool; and
f. braking actuating means, housed within one of the handle members so that positioning of the handle within a certain arc around its rotational axis provides frictional non-rotation of the spool and the spool member when a pull is exerted at the end of the length of fishing line.

4,679,347
FISHING FLASHER
Ronald H. Stirtz, 1660 Lorane Hwy., Eugene, Oreg. 97405
Filed Jun. 24, 1985, Ser. No. 747,862
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—43.1 **11 Claims**



1. A fishing flasher comprising:
an elongate, resilient blade having a transverse fold-line intermediate the ends of the blade defining a pair of substantially equal length blade segments extending divergently outwardly from and to either side of said fold-line, each of said blade segments extending from said fold-line to a free end and the blade segments with the flasher in a relaxed state having flat inner faces and extending in divergent planes thus to form a V-shape with the open end of the V-shape disposed rearwardly in the flasher;
an aperture extending through said blade adjacent said fold-line which aperture receives line mounting the flasher with the line extending through the aperture;
said blade segments outwardly of said fold-line being unsupported and being constructed and arranged to resiliently deform with the flasher drawn through the water at trolling speed whereby the blade segments are shaped to have concave inner faces facing each other of decreasing curvature extending from said fold-line and with the free ends of the blade segments substantially paralleling each other, said deforming of the blade segments reducing the drag produced by the flasher on such being drawn through the water.

4,679,348
TRAP DRAG
Eddie L. Wimberley, P.O. Box 266, Camp Wood, Tex. 78833
Filed Sep. 29, 1986, Ser. No. 912,326
Int. Cl.[4] A01M *23/24*
U.S. Cl. 43—96 **3 Claims**



1. A game trap drag for attachment to a game trap comprising:
a shank;
means for attaching said trap to said shank near a first end of said shank;
first and second arms extending generally perpendicularly outward from a second end of said shank and forming a crown at said second end;
first and second flukes attached on each of said first and second arm members, respectively, and radially extending outward therefrom to terminate in a point; and
an antihitching member consisting of a bar bent to define an apex between a first and second end of said antihitching member, said antihitching member attached at the junction of said first fluke and said first arm, and further attached at the junction of said second fluke and said second arm, said apex thereby extending outwardly beyond said crown.

4,679,349
FISH LINE SINKER
Conny Birchfield, 3509 NE. 53rd St., #30, Vancouver, Wash. 98661
Filed Feb. 10, 1986, Ser. No. 827,942
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.97 **6 Claims**

1. In combination a fish line, and sinker comprising; an elongated coil spring body member forming the outer configuration of the sinker having the properties of being resiliently

bendable and resiliently stretchable whereby regardless of orientation, upon getting wedged between objects it can be resiliently deformed by a pulling action to generate a snap back

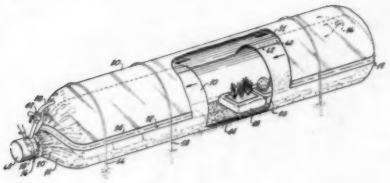
reaction, said body member being laterally rigid and thereby crush resistent, and attachment means attaching the body member to said fish line.

4,679,350

PLANT GROWING SHELTER

Maynard A. Banta, 11291 Weatherby Rd., Los Alamitos, Calif. 90720

Filed Oct. 14, 1986, Ser. No. 918,716
Int. Cl.[4] A01G *13/04*
U.S. Cl. 47—29 21 Claims



1. A plant shelter comprising

an at least partially sealed enclosure formed of thin, flexible, transparent material, and having top, bottom, side and end portions,

a shade sheet formed of a material having a decreased light transmissivity, said shade sheet being secured and sealed to side and end portions of said enclosure and having at least an intermediate portion spaced above the top portion of said enclosure, said shade sheet and said enclosure forming therebetween a return air duct extending along at least the top portion of said enclosure,

blower means for forcing air into said enclosure,

said enclosure having a return passage at one end thereof providing fluid communication between said enclosure at said one end and the interior of said return air duct, and

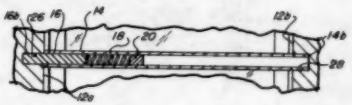
conduit means connecting the interior of said return air duct at a portion thereof remote from said return passage to said blower means, whereby air forced into said enclosure by said blower means is recirculated through said return air duct from said return passage and returned to said blower by said conduit means.

4,679,351

SECURITY BAR FOR WINDOW OPENING

Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211, and Phillip C. Zarlengo, 1379 S. Drexel Way, Lakewood, Colo. 80226

Filed Jun. 16, 1986, Ser. No. 874,409
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—57 1 Claim



1. A security bar for restricting passage through a window type opening having a pair of opposed frame members on opposite sides thereof and with a hole in each frame member comprising in combination:

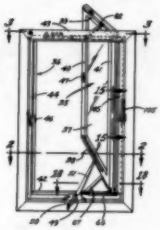
a cylindrical tube of rigid material having a length approximating the distance between said opposite frame members of the opening, one end of said tube adapted to be received in the hole in one of said frame members, the opposite end of said tube having an axially slidable cylindrical insert adapted to project into the other of said holes, a coil spring member positioned internally of said tube and adapted to bias said insert axially outwardly of the tube, and a stop fixed internally of the tube against which the coil spring member can react, said stop being made of a malleable material and being frictionally retained in place by axial compression of the malleable material which causes radial expansion into a tight friction fit with the interior of the tube.

4,679,352

HARDWARE FOR MOUNTING A WINDOW SASH

Wayne C. Bates, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed May 22, 1986, Ser. No. 866,237
Int. Cl.[4] E05D *15/52*
U.S. Cl. 49—192 11 Claims

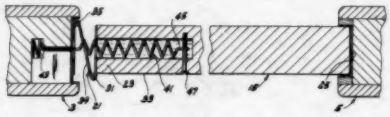


1. Hardware for mounting an upright window sash in a window frame, said hardware comprising pivot means supporting said sash to swing between closed and open positions about an upright axis located near one upright side of said sash, and means selectively operable (a) to hold said axis near the adjacent upright side of said frame as said window is swung from said closed position to said open position or (b) to cause said axis to travel toward the other upright side of said frame automatically as an incident to swinging of said sash from said closed position to said open position.

4,679,353
SECURITY DOOR

George Langenbach, 9127 Pardee Spur, and John F. Langenbach, 9017 Firewood Trail, both of St. Louis, Mo. 63126

Filed Sep. 29, 1986, Ser. No. 912,259
Int. Cl.[4] E05D *15/58*
U.S. Cl. 49—257 15 Claims



1. A security door comprising:

first and second vertical door jambs spaced from one another to define a doorway therebetween, the second door jamb having a generally channel-shaped recess therein extending generally vertically from adjacent the bottom of the jamb to adjacent the top of the jamb;

a door for closing said doorway;

hinge means on the first door jamb for supporting the door adjacent one vertical edge of the door, constituting its inner edge, and enabling it to swing on a generally vertical axis between an open position wherein the door is swung out of the doorway and a closed position wherein the door closes the doorway and the opposite vertical edge of the door, constituting its outer edge, is spaced inwardly from said recess in the second door jamb;

said door being movable outwardly in the plane of the doorway from its closed position to a secured position wherein said outer vertical edge is received in said vertical recess thereby to prevent the door from swinging out of its secured position;

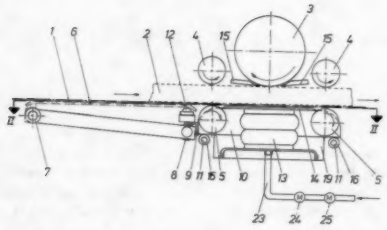
spring means for urging said door away from its secured position; and

locking means operable to pull the outer vertical edge of the door into said vertical recess and to maintain the door in its secured position against the urging of said spring means, said locking means comprising cooperable locking components in the door and said second door jamb.

4,679,354
GRINDING MACHINE FOR GRINDING OR RASPING OF RUBBER ITEMS

Svend Holst, Tarm; Niels Jensen, Hemmet, and Georg Jensen, Skjern, all of Denmark, assignors to B & J Rocket Rasp A/S, Tarm, Denmark

Continuation of Ser. No. 747,056, Jun. 20, 1985, abandoned.
This application Jul. 22, 1986, Ser. No. 888,275
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—76 R 6 Claims



1. A grinding machine for surface roughening a rubber workpiece for retreading of rubber tires comprising:

support means for holding the workpiece, and grinding element, said support means including,

(a) a flat support surface,

(b) means for supporting said support surface in a manner which makes it free to tilt in all directions, including:

(1) a pair of transverse bearing arms floatably supporting said support surface within predetermined limits so that said surface is relatively free to yield in response to variations in thickness of the workpiece,

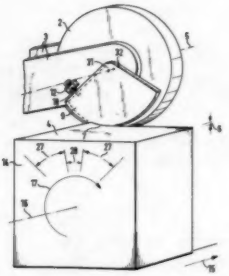
(2) upward bias means including a bellow engaging said support surface and generally centered between said arms and having its central axis generally in line with the center of the support surface, said bias means being independently controllable to urge the workpiece into engagement with said grinding element, said arms include journals and said support surface includes apertures sized substantially larger than said journals to receive said journals in loose engagement to accomodate the free tilting of the surface, and

(c) a conveyor belt situated atop said support surface for conveying the workpiece into engagement with said grinding element, said bellows having a top surface in contact with said support surface and wherein the periphery of said top surface is distant from the peripheral edges of said support surface, so that said support surface is free to tilt in all directions in response to variations in the workpiece.

4,679,355
APPARATUS FOR GRINDING A SEMIFINISHED STEEL PRODUCT

Egon Evertz, Vorlander Strasse 23, D-5650 Solingen, and Rolf Seybold, Solingen, both of Fed. Rep. of Germany, assignors to Egon Evertz, Solingen, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,653
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517302
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—99 13 Claims



1. An apparatus for grinding a semifinished steel product which requires removal of material up to the penetration depth of cracks near the surface thereof and which is advanced in the direction of the longitudinal axis thereof whilst being rotated about said longitudinal axis, said apparatus comprising a support member movably mounted on the apparatus, a bearing provided in said support member, a grinding wheel mounted in said bearing with its axis parallel to the longitudinal axis of the semifinished product and arranged so that its axis is movable relative to the semifinished product, a stop member in the form of a segment of a circle pivotally mounted on the support member with its pivotal axis coaxial with the axis of the grinding wheel but spaced from the center of the circle so that the circle is eccentric relative to the axis of the grinding wheel, and means for pivotally adjusting and locking the stop member in position, said stop member resting on the unabraded surface of the semifinished product at a position which is spaced from the point of engagement of the griding where by a distance which

corresponds to the penetration depth of the grinding wheel and said stop member controlling the position of the grinding wheel relative to the surface of the semifinished product so that material is removed uniformly around the entire periphery of the semifinished product.

4,679,356

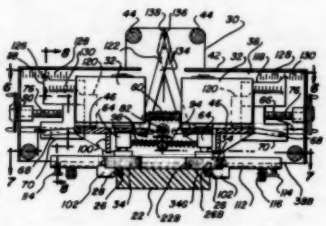
AUTOMATIC SKI TUNING DEVICE

Jacques B. Thomas, P.O. Box 3111, Winter Park, Colo. 80482

Filed May 9, 1986, Ser. No. 861,604

Int. Cl.[4] B24B *9/00*

U.S. Cl. 51—205 WG **15 Claims**



1. A device for filing the bottom edge of a ski wherein the ski varies in width along its length comprising in combination,

frame means adapted to be moved along the length of the ski,

motor means mounted on said frame means,

grinding means operably connected to said motor means and adapted to engage the bottom edge of said ski as the frame means is moved along the length of the ski, and

operative mechanism means on said frame means adapted to adjust the angle of said grinding means relative to the bottom of the ski whereby the edge can be ground at an angle relative to the bottom of the ski.

4,679,357

METHOD AND APPARATUS FOR DISPLACING A HONING TOOL

Günter Richter, Kirchheim-Nabern, and Reinhard Fröschle, Ostfildern, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co., Ostfildern, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,610

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421193

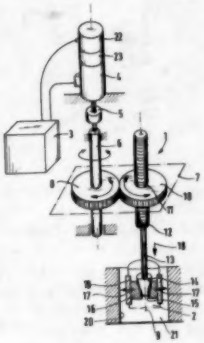
Int. Cl.[4] B24B *33/02, 33/08*

U.S. Cl. 51—281 P **1 Claim**

1. A method of displacing a honing tool having stones for stock removal in workpiece bores, including the steps of initially rapidly feeding said tool until the latter contacts the workpiece, and then changing over to a slower stock removal feed step; the improvement therewith which comprises in combination the steps of:

effecting said rapid feeding and said stock removal feed by means of a single motor employed during said rapid feeding and said stock removal feed;

presetting the rapid feeding speed, the stock removal feed speed, and a respective torque limit of said motor; introducing said honing tool into said workpiece bore, thereupon rapidly feeding the honing stones of said tool with feeding means, and in so doing operating said single motor of a continuing feed at high speed and low torque limit in conformity with said preset values; turning said single motor off when said honing stones come to rest against the wall of said workpiece bore, and when said preset torque limit of said single motor is reached; after said honing stones come to rest against said bore wall and said single motor is shut off, temporarily changing the direction of rotation of said single motor and slightly backing-off said honing stones from said bore wall; after the conclusion of said backing-off step, automatically initiating a stroke motion of said honing tool, tool rotation and stock removal feeding, which pursuant to said presetting operates at a low stock removal feed speed and high torque limit; after achieving a predetermined finished size value, stopping said stock removal feeding, and briefly rotating said single motor in the opposite direction in order to back-off said stock removal feeding by a predetermined amount; inputting into a first input element a stock removal feeding value which in conformity with the stock removal task is necessary for the first of a series of workpieces which are to be machined; upon achieving this feeding value stopping said stock removal feeding; and storing the thusobtained position in a feed control mechanism as the finished size value; inputting, into a second input element of said feed control mechanism, a previously determined honing stone wearvalue which is related to a machined workpiece; and adding this value, in said feed control mechanism, to said finished size value to form a new finished size value, which is then stored;



operating said feed control mechanism via pulses; successively inputting into a position cycle regulator, for said stock removal feeding, one pulse at a time; and

utilizing said pulse in such a way that with each pulse, said single motor is rotated further by a specific angular step, thus operating said single motor also as a quasi stepping motor particularly during said stock removal feeding.

4,679,358

GRINDING WHEEL ADVANCING APPARATUS

Christopher Z. Sieradzki, Homewood, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 20, 1986, Ser. No. 842,111

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165.72 **1 Claim**

1. A grinding apparatus comprising

a first carriage means mounted on a track assembly, a first drive means adapted to move said first carriage means laterally along said track assembly to an operating position and a fully retracted position,

a second carriage means mounted on said first carriage means, a second drive means mounted on said first carriage means and adapted to move said second carriage means laterally along said first carriage means,

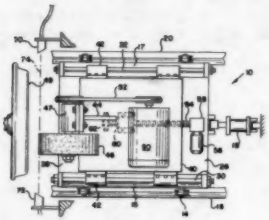
a grinding wheel assembly mounted on said second carriage means, said grinding wheel assembly including a grinding wheel and a drive mechanism,

a sensing mechanism comprising a light source emitting a light beam and a light receiver so positioned such that

when said first carriage means is at said fully retracted position, and said grinding wheel is within acceptable wear condition, said light beam when activated will be blocked from entering said light receiver by said grinding wheel,

and when said first carriage means is at said fully retracted position and said grinding wheel is worn beyond preselected wear conditions, said light beam when activated will be able to enter said light receiver and thereby activate said second drive means to laterally move said second carriage means until said grinding wheel blocks said light beam thereby deactivating said second drive means,

and wherein said second drive means comprises a screw mechanism connected at one end to a motor mounted on said first carriage, an engaging gear mounted on said second carriage means with said screw mechanism passing through said engaging gear, such that upon rotation of said screw mechanism, said second carriage means is moved in relation to said first carriage means.



4,679,359

METHOD FOR PREPARATION OF SILICON WAFER

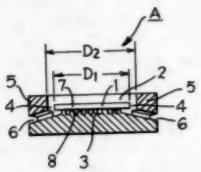
Akira Suzuki, Gottemba, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Dec. 20, 1985, Ser. No. 811,611

Claims priority, application Japan, Dec. 28, 1984, 59-274949

Int. Cl.[4] B24C *1/06*

U.S. Cl. 51—321 **6 Claims**



1. A process for finishing a silicon wafer, comprising the steps of:

providing a mono-crystal silicon block;

cutting said block to form a thin waferlike disc;

rough grinding a surface of the disc to effect partial finishing thereof and to provide the disc with the approximate desired thickness;

reducing the roughness of the ground surface by blasting the ground surface of the disc with a slurry composed of silicon carbide particles and water so as to effect removal of a majority of the metamorphosed layer formed on the surface during the cutting and grinding steps and to provide the surface with a satinlike matte finish; and then

polishing the surface of the disc to provide a mirrorlike finish.

4,679,360

LAMELLAR END GRINDING WHEEL

Gerd Eisenblätter, Jägerweg 10, 8192 Geretsried 2, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 865,973

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541347

Int. Cl.[4] B24D *13/14*

U.S. Cl. 51—337 **19 Claims**

1. Lamellar end grinding wheel comprising

a circular disc-shaped flexible back plate,

grinding flaps arranged along a circumferential zone of said back plate so as to overlap one another in tile-like manner and being fixed there, said grinding flaps being passed through radial slots formed in said circumferential zone, said back plate being constructed as a sheet metal plate,

a supporting plate arranged on the side of said back plate remote from a working surface, said supporting plate being firmly connected to said back plate at least on the outer circumference of said back plate,

rear ends of said grinding flaps being fixed between said back plate and said supporting plate, and

a circumferential edge of said back plate being bent over towards a side remote from said working surface to form a hook-like circumferential flange in radial section and said supporting plate being fixed under said hook-like circumferential flange.

4,679,361

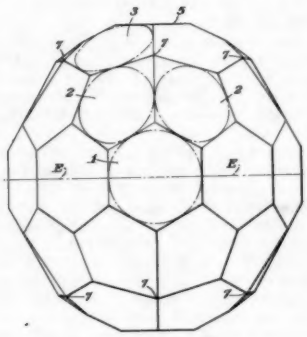
POLYHEDRAL STRUCTURES THAT APPROXIMATE A SPHERE

J. Craig Yacoe, 108 Harvey La., Chadds Ford, Pa. 19317

Filed Jan. 13, 1986, Ser. No. 817,927

Int. Cl.[4] E04B *1/32, 7/08*

U.S. Cl. 52—81 **8 Claims**



1. A polyhedron that approximates a sphere, the sphere having an equator and two poles, the polyhedron having a plurality of polygonal faces, in which each vertex of the poly-

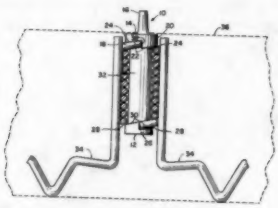
hedron is a junction of three or four polygonal edges, wherein each edge of each polygon is tangent to the approximated sphere at one point, each polygonal face being defined in a manner such that a circle can be inscribed therein that is tangent to each edge of the polygon at one point, wherein the polyhedron comprises two substantially parallel faces that are regular polygons said two parallel faces located at the poles to form polar caps and at least half of the remaining faces are selected from non-equilateral hexagons and pentagons, wherein the irregular polygonal faces are positioned in rings, including a first ring in a substantially equatorial position with respect to the approximated sphere and the centers of the inscribed circles of the polygons of more polar rings being at substantially the same latitude in each ring, and wherein successively more polar rings of polygons contain faces which are either equal in number or one-half the number of faces in the next most equatorial ring adjacent to each polar cap contains no more than one half the number of faces in the first ring.

4,679,362

VOID PLUG LIFT INSERT ASSEMBLY FOR A CAST CONCRETE PRODUCT

Richard C. Mess, Stone Mountain, Ga., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 12, 1980, Ser. No. 158,986
Int. Cl.[4] E04B *1/41, 1/38*
U.S. Cl. 52—125.5 **7 Claims**



1. A lift insert assembly for imbedment in a concrete product comprising:

(a) a substantially cylindrical insert for receiving a lifting device;

(b) means secured to said insert for supporting said insert in perpendicular spaced relation with the upper surface of said concrete product;

(c) a void plug filling said insert, said void plug being comprised of an elastomeric tubular body member closed at one end and open at the other end;

(d) an integral annular collar extending radially from said closed end and having a longitudinally inwardly facing shoulder means overlying and shaped conformably to the shape of the upper end of said insert;

(e) integral abutment means extending radially from said open end and overlying and residing against the lower end of said insert;

(f) the longitudinal distance between said shoulder means of said collar and said abutment means being less than the corresponding length of said insert, such that, upon insertion, said void plug is stretched to place said shoulder means and abutment means in overlying intimate contact with the respective ends of said insert; and

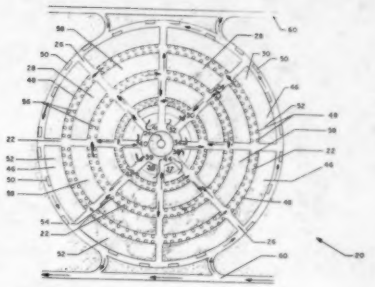
(g) the intermediate surface of said body member, between said shoulder means and said abutment means, being free of threads.

4,679,363

TOWNSHIP, CITY AND REGIONAL LAND ARRANGEMENT

George W. Adams, 425 Muddy Branch Rd. #101, Gaithersburg, Md. 20877

Filed Jan. 28, 1986, Ser. No. 823,276
Int. Cl.[4] E04H *3/04*
U.S. Cl. 52—169.3 **41 Claims**



1. A township land arrangement comprising:

a first plurality of concentric circular roadways, and a common center area defined at the center of said roadways;

a second plurality of roadways radially extending outwardly from said center area and intersecting said first plurality of roadways;

a first plurality of segment areas, each of said first plurality of segment areas defined by adjacent ones of said radially extending roadways and innermost and outermost ones of said concentric roadways;

each of said first plurality of segment areas defining a plurality of substantially curved-shaped adjacent land areas, each of said curved-shaped adjacent land areas bounded by adjacent ones of said concentric roadways and by adjacent ones of said radially extending roadways; and

said center area being substantially circular in shape and including a council house and a civic center.

4,679,364

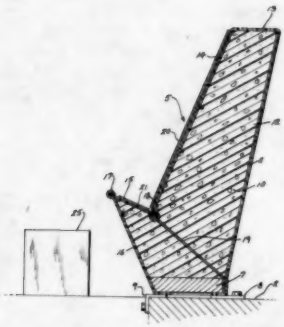
DOCK SEAL

Robert P. Fettig, Waterford; Matthew J. Bushman, and Glenn M. Miller, both of Milwaukee, all of Wis., assignors to Kelley Company Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,347
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—173 DS **21 Claims**

1. In combination, a loading dock having a wall with a doorway therein, a dock seal mounted on the outer surface of said wall and bordering said doorway, said dock seal including a pad of resilient material mounted along the side of said doorway, said pad having an outer end and having an inner end mounted on said wall, said pad including a first vertical surface extending inwardly toward the dock from said outer end, said pad also having a second vertical surface extending laterally in a direction toward the center of said doorway and disposed generally normal to said first surface, said first and second surfaces being joined at an inside vertically extending corner, and a sheet of impact resistant flexible material disposed on said first surface, said first and second surfaces being constructed and arranged so that engagement of said pad by a truck body

backing toward the dock will compress and deform said pad to urge said first surface into engagement with the outer side of



the truck body and move said second surface into engagement with the rear end of the truck body.

4,679,365

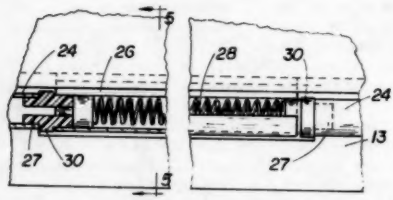
EMERGENCY EXIT FOR A PERSONNEL CHAMBER

Charles Herring, Rte. 3, Greenville, Ill. 62246

Filed Sep. 25, 1985, Ser. No. 779,961

Int. Cl.[4] E05B 65/10; E06B 1/04

U.S. Cl. 52—204 **2 Claims**



1. In combination with a vertical peripheral wall of a mobile home having an interior horizontal floor and vertical peripheral side walls extending therefrom, said side walls having inner and outer faces and upper and lower portions, an exit opening in at least one of the lower portions of one of said vertical peripheral side walls adjacent said interior floor of said mobile home to permit exit from a crawling position, said exit opening being sized and positioned relative said interior floor of said mobile home to permit personnel to exit therethrough from a crawling position on the floor of said mobile home in an emergency; an inner wall frame member including joined vertical and horizontal leg members, said frame member being sized to conform with said exit opening with one of said leg members extending horizontally into said opening to provide a peripheral border therefor and the other of said leg members extending vertically to be fastened to said inner face of said vertical side wall; a door assembly including an outer wall frame member of spaced upper and lower horizontal leg members joined at their extremities by spaced vertical leg members, said leg members being generally staggered seat shaped right angle cross-section having two oppositely extending vertical leg portions joined by connecting intermediate leg portions which nest in one of the legs of said inner wall frame members, one of said outer wall vertical leg portions of said door assembly being fastened to said outer face of said vertical wall and the other oppositely extending vertical leg portion of said door assembly providing a door panel seat; said door assembly having a door panel comprised of a border frame including joined vertical and upper and lower horizontal legs nestingly receiving peripherhal edges of spaced inner and outer wall sheets with insulation material sandwiched therebetween, said border frame of said door panel having a butt hinge connecting with said outer wall frame member along the lower horizontal leg thereof, said hinge connection including dovetailing tubular segments integral with said outer wall frame member and said door panel respectively to form a butt hinge when dovetailed, said dovetail segments being pivotally connected about the longitudinal axis thereof by spring load pin members disposed within said integral tubular segments for gravitational pivotal movement of said door panel outside said mobile home when pushed out of closed position; and an actuable locking member including a bolt housing mounted on the inner wall sheet and upper horizontal leg of said border frame of said door panel on the upper side thereof and an arcuate spring loaded bolt slidably disposed within said housing to hold said door panel in closed position against said outer door frame, said bolt member being hand actuable by personnel when in the crawling position on the floor of said mobile home.

4,679,366

MODULAR BUILDING COMPONENT

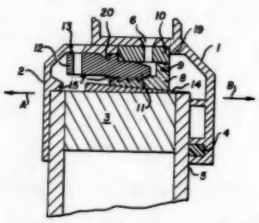
William G. Hitchins, "Fiddawn", New Cascade Road, Norfolk Island, Australia (2899)

Filed Jul. 23, 1985, Ser. No. 758,085

Claims priority, application Australia, Jul. 23, 1984, PG6168

Int. Cl.[4] E06B 1/04

U.S. Cl. 52—217 **3 Claims**



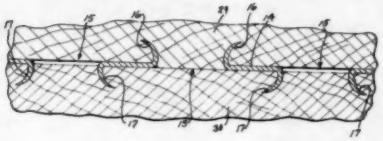
1. A device for attaching first and second frame parts about opposite sides of the periphery of an aperture in a wall of a building; said device comprising a U-shaped female member having first and second limbs pivotally attached one to the other and each having one inwardly-facing side forming a bight therebetween, a cooperating male member insertable into said bight of said U-shaped female member; means attaching said female member to said frame first part, said female member having a plurality of teeth on said inwardly-facing side of one said limb thereof; means attaching said male member to said second frame part, said male member having a plurality of co-acting teeth on a side thereof; whereby, with said female and male members attached to said first and second frame parts respectively and the said two frame parts fitted together, said male member is received within said bight of said female member so as to be locked therein by means of the mutual engagement of said teeth and co-acting teeth; and a portion of the periphery of the wall aperture having a ramp along which one said limb of said female member is adapted to slide when said frame parts are fitted together to thereby urge the said two members into locking relationship.

4,679,367

INTERCONNECTING OF WOODEN MEMBERS

Alan C. Geisthardt, North Fond du Lac, Wis., assignor to Jack Walters & Sons, Corp., Allenton, Wis.

Filed Aug. 29, 1985, Ser. No. 770,691
Int. Cl.[4] B24B 47/02; B27F 7/00
U.S. Cl. 52—233 17 Claims



1. A method of making a wooden composite assembly such as a beam, post or the like, said method comprising:

(a) positioning a plurality of elongated wooden boards of varying lengths in spaced face-to-face relationship to thereby form a plurality of parallel layers and so that at least one of said layers is formed of a plurality of boards having a total length about equal to the length of an adjacent layer,

(b) abutting the inner ends of the plurality of boards in said at least one of said layers to form a generally planular joint between said abutting ends,

(c) providing a connector device having a base plate with a plurality of spaced openings therein, and with said openings having a plurality of wood engaging prongs extending outwardly therefrom and initially generally normal to said base plate, the prongs of alternate adjacent openings extending in opposite directions from said base plate,

(d) positioning said connector device between said parallel layers so that said base plate bridges the inner portion of said joint and so that oppositely extending prongs engage the opposing faces of boards in adjacent layers and form an assemblage,

(e) and compressing said assemblage to form a rigid composite assembly so that said prongs deform and clinchingly engage the wood surrounding said joint and splice the boards forming said joint together as well as holding facing boards in adjacent layers together.

11. A rigid wooden composite assembly such as a beam, post or the like, said assembly comprising, in combination:

(a) a plurality of elongated wooden boards of varying lengths disposed in face-to-face relationship and forming a plurality of parallel layers with at least one of said layers being formed of a plurality of boards having a total length about equal to the length of an adjacent layer,

(b) the inner ends of said last-named plurality of boards being disposed in abutting relationship and thereby forming a generally planular joint therebetween,

(c) and a connector device having a base plate with a plurality of spaced openings therein, and with said openings having a plurality of prongs extending outwardly therefrom and initially in a direction generally normal to said base plate,

(d) the prongs of alternate adjacent openings extending in opposite directions from said base plate,

(e) said connector device being disposed between said parallel layers so that said base plate bridges the inner portion of said joint with said oppositely extending prongs penetrating the opposing faces of boards in adjacent layers,

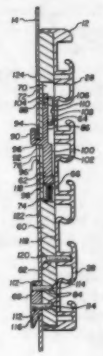
(f) said assembly being compressed together into a unified structure with said prongs being deformed and clinchingly engaging the wood surrounding said joint and splicing the boards forming said joint together as well as holding facing boards in adjacent layers together.

4,679,368

RAIL PANEL MOUNTING LATCH

Frederic R. Pettinga, Grand Rapids, and Steve F. Goodman, Wyoming, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 13, 1985, Ser. No. 797,446
Int. Cl.[4] A47H 27/00
U.S. Cl. 52—36 22 Claims



1. A wall panel having a front and a back and adapted to be removably mounted to a vertical slotted standard having a plurality of vertically spaced slots, a front face and a rear face, said panel comprising:

a support means secured to said panel and registrable with a first slot of said standard to at least partially support said panel on said standard;

a latch means mounted to said panel, vertically movable between locked and unlocked positions, registrable with a second slot of said standard, when said latch means is in said unlocked position and said support means extends through said first slot, and engageable with said rear face of said standard adjacent said second slot, when said latch means is in said locked position and said support means engages said rear face adjacent said first slot, to securely mount said panel to said standard; and

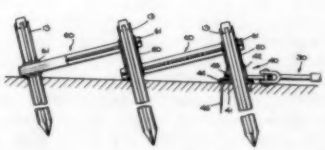
an actuating means movably mounted to said panel and for actuating movement of said latch means between said locked and unlocked positions.

4,679,369

ANCHORING SYSTEM

Ann M. Kinsley, Havertown, and William A. Mansi, Yeadon, both of Pa., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Mar. 15, 1985, Ser. No. 712,581
Int. Cl.[4] B64F 1/16, 1/02
U.S. Cl. 52—155 7 Claims



1. A multiple stake ground anchoring system comprising:

a stake guide having a base section and an elongated hollow sleeve section which is inclined to the base section and which extends therethrough;

a first stake extending through said hollow sleeve of the stake guide;

a hollow spacer collar mounted on said sleeve section of the stake guide and in coaxial alignment therewith, said spacer collar being sized to permit the passage of said stake closely through its hollow interior;

a rigid elongated stake tie having two passages extending through it, said passages having parallel axes and being sized to permit the passage of said stake closely therethrough, said stake tie being mounted on said spacer collar with one of its passages in coaxial alignment with said hollow spacer collar; and

a second stake extending through the passage in said stake tie which is distal to that mounted on said spacer collar, whereby said second stake is rigidly connected to said first stake and both said stakes are at the same angle of inclination with respect to the base section of said stake guide.

4,679,370
SURFACE-FORMING PANEL

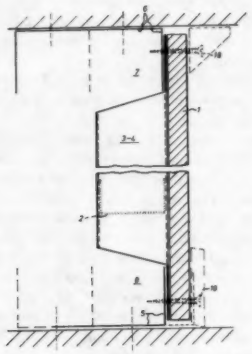
Björn Samuelsson, 93, Ryttmästarvägen, Vällingby, Sweden (S-162 24)

Continuation of Ser. No. 548,159, Nov. 2, 1983, abandoned. This application Apr. 14, 1986, Ser. No. 852,087

Claims priority, application Sweden, Nov. 5, 1982, 8206293

Int. Cl.⁴ E04B *2/00*

U.S. Cl. 52—407 **12 Claims**



1. In a wall structure of a building, a surface-forming panel comprising a planar rectangular facing element of building material, a collapsible sheet metal reinforcing framework on a rear surface of the element, the element having a first pair of opposite edges and a second pair of opposite edges perpendicular to the first pair of edges, and attachment means between the panel and the wall structure independent of the reinforcing framework comprising plural foldable profiled elements each having a flange portion secured to the rear surface of the facing element and a body portion with bend lines for unfolding the element from a transport position, the framework including a pair of of the profiled elements positioned in parallel along the first pair of opposite edges of the facing element, the wall structure including parallel panel supports substantially aligned with the second pair of opposite edges, the attachment means consisting entirely of fasteners connected between the panel and said supports, the profiled elements extending lengthwise between the supports in substantially continuous engagement with a rear surface of the panel thereby providing reinforcement for the panel between said supports and the profiled elements being adapted for folding in a direction perpendicular to their length.

4,679,371
PROFILE

Ann-Christin Jilken, Sundsvall, Sweden, assignor to Adenco Engineering AB, Lidingo, Sweden

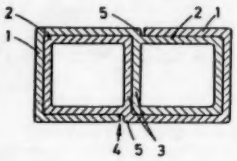
PCT No. PCT/SE83/00217, § 371 Date Feb. 2, 1984, § 102(e) Date Feb. 2, 1984, PCT Pub. No. WO83/04294, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 1, 1983, Ser. No. 589,080

Claims priority, application Sweden, Jun. 4, 1982, 8203465

Int. Cl.⁴ E04C *1/04*

U.S. Cl. 52—574 **4 Claims**



1. A combination including a first and a second profile, wherein each said profile consists of first and second sections (1, 2) rigidly joined together, each first section (1) being an open walled hollow section with an inner contour and each second section (2) being a closed hollow section with an outer contour, the inner contour being uniform with and somewhat bigger than the outer contour wherein each first section has an opening (4) arranged so that said first and second profiles can be telescoped into one another, each opening (4) having a width which is substantially no wider than the thickness the wall of the open walled hollow section (1) disposed in that opening (4) when the profiles are so telescoped, whereby the first section of the first of the telescoped profiles substantially, completely surrounds and rigidly interlocks with the second section (2) of the second of the telescoped profiles without recourse to additional members.

4,679,372
SPACE FRAME APPARATUS AND A SPACE FRAME EMPLOYING SUCH APPARATUS

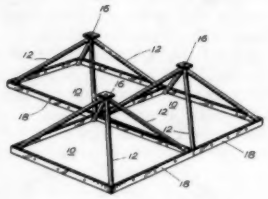
Alfred H. Noble, 310 Highland Road, Kensington, Johannesburg, Transvaal, South Africa

Filed May 23, 1985, Ser. No. 737,189

Claims priority, application South Africa, May 24, 1984, 84/3943

Int. Cl.⁴ E04H *12/00*

U.S. Cl. 52—648 **4 Claims**



1. A space frame unit and a hollow box connector combination.

the space frame unit comprising

a substantially rectangular integral frame having edges provided with upstanding lips, said edges being connected to adjacent edges of frames of similar space frame units placed side-by-side with the space frame unit thereby connecting the frames together in side-by-side relationship; at least four elongated structural members fixedly attached to the frame at the corners of the

frame and converging towards one another to form an apex of the space frame unit being substantially remote from the frame thereof;

a fixing plate arrangement at the apex permanently receiving ends of the structural members remote from the frame;

the hollow box connector comprising

a lid spaced from the fixing plate arrangement, an open-ended tubular member located between the lid and the fixing plate arrangement at the apex of the space frame unit having a plurality of holes in its walls; and

bolt means serving to draw the lid and the fixing plate arrangement towards one another, said bolt means passing through the tubular member, thereby holding the tubular member between the lid and the

fixing plate arrangement; the holes in the tubular member permitting connection to the tubular member of cross-members and connecting the apex of the space frame unit to the apices of the other space frame units placed side-by-side therewith.

4,679,373

METHOD AND DEVICE FOR THE ALIGNING OF AN ELEMENT, E.G. FRAME, TO BE INSERTED INTO A WALL OPENING

Bernd Ludwig, Heylstrasse 33, D-6460 Gelnhausen, Fed. Rep. of Germany

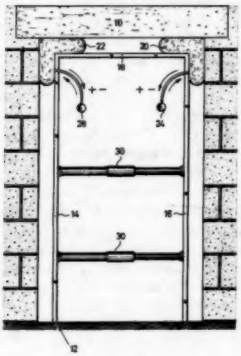
PCT No. PCT/EP84/00395, § 371 Date Aug. 5, 1985, § 102(e) Date Aug. 5, 1985, PCT Pub. No. WO85/02648, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 10, 1984, Ser. No. 767,199

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 8335189[U]; Mar. 7, 1984, 8406973[U]

Int. Cl.⁴ E06B *1/58;* E04F *21/00*

U.S. Cl. 52—745 **21 Claims**



1. A method for aligning elements such as frames, door frames, window frames or the like in, for example, a wall opening, wherein the space between the two may have to be filled with foam and a compensating element has to be arranged in each of at least two corner areas to adjust the element inside of the opening, wherein inflatable air bags, as removable compensating elements, are placed between the upper corner areas of the element and the wall opening, said air bags exerting controlled pressure on the longitudinal jambs and the crosspiece running between said jambs.

4,679,374

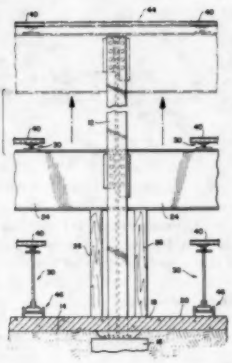
BUILDING CONSTRUCTION METHOD

Robert Boehmig, 850 Glenairy Dr., NE., Atlanta, Ga. 30328

Filed Dec. 3, 1984, Ser. No. 677,345

Int. Cl.⁴ E04G *21/14*

U.S. Cl. 52—745 **10 Claims**



1. A method for constructing an entire roof system for single story building structures comprising:

installing an array of upstanding columns upon a prepared ground surface in spaced parallel lines and transverse rows to define bays between adjacent column lines with groups of columns in said adjacent lines defining therebetween the corners of panel areas within said bays;

assembling large primary and smaller secondary panels at a convenient working height near said surface, said primary panels to form the roof structure over alternate bays and said secondary panels to form the roof structure over bays intermediate to said alternate bays, assembling said primary panels including placing beams of a length to extend between adjacent columns in a line of columns at each end of each said primary panel, securing spaced joists perpendicularly to and extending between said beams with the end most joists secured inwardly of the ends of said beams, assemblying said seondary panels including temporarily securing to the beams spaced parallel secondary panel joists which extend between the beams of the primary panels located in adjacent ones of said alternate bays with the end most joists of said secondary panels being temporarily secured inwardly of the ends of said beams, and securing joist bridging perpendicular to said primary and secondary panel joists;

temporarily storing selected ones of said secondary panels in underlying relationship to selected ones of said primary panels to thereby clear said surface in at least a portion of said intermediate bays;

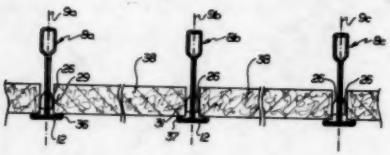
utilizing said portion of said intermediate bays to accommodate lifting equipment; and

successively raising and connecting said primary and secondary panels to the upper ends of said columns that are disposed at the corners of each said panel area.

4,679,375
SUSPENSION CEILING GRID SYSTEM WITH NARROW-FACED GRID

Richard Shirey, Avon Lake, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Sep. 23, 1983, Ser. No. 535,382
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—777 **22 Claims**

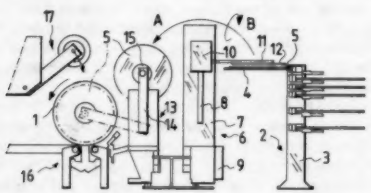


1. A narrow-faced suspension ceiling grid system comprising a plurality of grid tees interconnected to form a grid providing a plurality of panel openings, said grid tees providing a bulb a planar central web and a pair of opposed flanges extending from the side of said web opposite said bulb, the lower surface of said flanges being exposed and providing said grid tees with a face having a fixed face width equal to the distance between the edge extremities of said opposed flanges, said edge extremities being spaced apart about 9/16 inch, a plurality of unrabbeted panels positioned in said panel openings each providing a lower planar surface extending to lateral edges thereof, said lower surface of said panels overlying associated flanges of said grid tees and being supported thereby, said panels being undersized with respect to said grid to provide a predetermined maximum clearance of about 5/16 inch with respect to said webs of said grid tees, said web providing centering means operable to center said panels and provide a substantially uniform spacing of at least about ⅛ inch between said edges of said panels and the plane of said webs.

4,679,376
ARRANGEMENT IN A ROLL WRAPPING APPARATUS FOR THE APPLICATION OF HEADERS

Karl-Erik Ekblom, Mäntsälä, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Dec. 31, 1985, Ser. No. 815,006
Claims priority, application Finland, Dec. 31, 1984, 845174
Int. Cl.[4] B65B *61/22*
U.S. Cl. 53—137 **6 Claims**

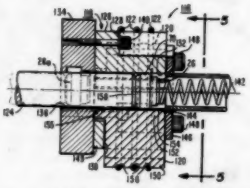


1. An arrangement in a roll wrapping apparatus for the application of soft inner headers to the ends of paper rolls which comprises
a storage unit,
storage members located in said storage unit for carrying different size headers,
a transfer unit having a frame,
an application unit having a frame,
first gripping means supported on said transfer unit frame for shifting a header from said storage unit to said application unit,
second gripping means carried by said application unit frame for shifting the header to a position against the end of the roll,
said second gripping means receiving the header from said first gripping means and holding the header over its center area, and
means for rotating said second gripping means so as to keep the header aligned by the effect of centrifugal force while said seond gripping means shifts the header onto the end of the roll.

4,679,377
APPARATUS FOR APPLYING AN END PLUG TO AN END OF A FUEL ROD TUBE

Stuart L. Rieben, and Mark E. Wylie, both of Mt. Lebanon Twp., Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 678,519, Dec. 5, 1984. This application Jun. 12, 1986, Ser. No. 873,642
Int. Cl.[4] G21C *3/10*
U.S. Cl. 53—327 **5 Claims**



1. An end plug applying apparatus for applying an end plug to a hollow tube end of a nuclear fuel rod such that a frictional interfitting engagement will be established between the end plug and the tube end facilitating the formation of a connection therebetween which hermetically seals the fuel rod, said apparatus comprising:
(a) a housing having spaced inlet and outlet ends, said inlet end adapted to receive the end plug and said outlet end adapted to receive the tube end to which the plug is to be applied;
(b) guide means disposed in said housing and having internal surface portions which define an internal guide channel aligned in tandem with said inlet and outlet ends of said housing along a common axis and being of a cross-sectional size smaller than that of an outer external surface of the end plug, said guide means being yieldably expandable radially with respect to said common axis;
(c) means defining an infeed opening adjacent said inlet end of said housing and displaced laterally of said common axis through which the end plug is fed in a direction extending toward said common axis to a loading position in front of said inlet end of said housing; and
(d) means disposed adjacent said inlet end of said housing and movable along said common axis for engaging and moving the end plug from said loading position in front of said inlet end, through said inlet end and through said guide channel, to said outlet end, said movement of said plug through said guide channel causing yieldable expansion of the cross-sectional size of said guide means such that said surface portions of said guide means conform to the outer external surface of the end plug and maintain guiding contact therewith as the end plug is moved through said guide channel;
(e) said housing has a series of elongated guideways spaced from one another about said common axis, and the elongated axis of each guideway extending generally radially from said common axis;
(f) said guide means includes

a plurality of elongated guide members mounted in said respective guideways for radial movement relative to said common axis and having inner portions facing toward one another so as to define said guide channel therebetween and the elongated axis of each guide member extending generally radially from said common axis, and

a plurality of flexible resilient expandable endless members surrounding said plurality of guide members so as to bias said guide members toward one another, said endless members yieldably allowing movement of said guide members away from one another upon contact of said inner portions thereof with the end plug for establishing and maintaining guiding contact with the end plug as the same is moved through said guide channel.

4,679,378

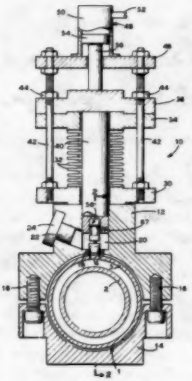
VACUUM SEALING DEVICE FOR INSULATED STEAM INJECTION TUBING

Paul T. Anderson; Lawrence Irwin; John C. Matthews, all of Lancaster; Charles E. Paugh, Winchester, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 776,254, Sep. 16, 1985. This application Aug. 15, 1986, Ser. No. 897,181

Int. Cl.[4] B65B *31/02*

U.S. Cl. 53—405 **4 Claims**



1. A method of plugging a vacuum port in a tube with a plug having a sealing pin comprising holding clamping means around the tube and over the port, the clamping means having a space with an opening communicating with the port, drawing a vacuum from the space to draw a vacuum from the port, moving the plug of the sealing pin into the port for sealing the port and breaking the plug away from a remainder of the sealing pin to leave the plug in the port.

4,679,379

AUTOMATIC BUNDLING MACHINE

Paolo Cassoli, Casalecchio Di Reno, Italy, assignor to Cassoli s.r.l. Macchine Automatiche Confezionatrici, Bologna, Italy

Filed Sep. 13, 1983, Ser. No. 531,740

Int. Cl.[4] B65B *63/02*

U.S. Cl. 53—438 **18 Claims**

1. An automatic bundling apparatus for bundling selected number of articles in bundles with sheet material for use in combination with a conveyer means for feeding horizontally disposed rows of articles to said apparatus, said apparatus comprising:

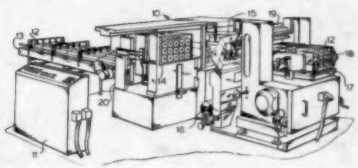
a wrapping stage having a sheet material supply reel, a hollow mandril having an entrance at one end and an exit at the opposite end, and a means for folding said sheet material around the outside of said mandril for forming a tubular first wrapper having one open end generally aligned with said entrance and one sealed end adjacently beyond said exit;

a main ram disposed in front of said entrance of said mandril and adjacent said open end of said wrapper;

a collating stage for receiving a selected plurality of stacked rows of said articles from said conveyer means;

a compressing stage for receiving said articles from said collating stage, said compressing stage having means for, in sequence, transporting said stack of rows to a position between said main ram and said mandril entrance and for simultaneously compressing the height and the width of said stack of rows;

a control means for actuating said ram for pushing said stack of rows through said entrance and the inside of said mandril such that said stack of rows advances through said mandril and out of said exit and pushes against said sealed end of said wrapper and moves on beyond said exit and advances said wrapper off of said mandril and simultaneously advances a discrete amount of sheet material from said supply reel around the outside of said mandril for forming a next wrapper for a next stack of rows; and



a cutting and sealing stage disposed adjacently beyond said exit for receiving thereby said first wrapper with said stacks of rows in said first wrapper from said wrapping stage, said cutting and sealing stage having means for simultaneously sealing the open end of said first wrapper, between said exit and the trailing end of the advanced stack of rows in said first wrapper, and forming the sealed end of said next wrapper, and separating said first wrapper from said next wrapper.

4,679,380

TREATMENT OF POROUS STRUCTURES

Norman Rudd, 110 London Rd., Aston, Clinton, Aylesbury, Buckinghamshire, United Kingdom

PCT No. PCT/GB84/00412, § 371 Date Aug. 1, 1985, § 102(e) Date Aug. 1, 1985, PCT Pub. No. WO85/02429, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 30, 1984, Ser. No. 767,294

Claims priority, application United Kingdom, Dec. 2, 1983, 8332209

Int. Cl.[4] B65B *3/00, 63/00*

U.S. Cl. 53—440 **9 Claims**

1. A method for the treatment of a porous structure with a treating solution, comprising the steps of:

forming a tube from plastics material, the tube having a diameter;

seaming the tube with a first transverse seam to form a first end of a jacket;

filling the jacket with the treating solution through a second end of the jacket which is open;

sealing the jacket with a second transverse seam to close the second end;

bundling the jacket in the region of the first and second ends of the jacket to form a substantially cylindrical rod;

freezing the jacket and the enclosed treating solution to form a rod;

removing the jacket from the rod of treating solution; and

inserting the rod of the treating solution into a cylindrical opening in the porous structure wherein the diameter of

the cylindrical opening is greater than the diameter of the tube.

4,679,381

APPARATUS FOR AND METHOD OF LOADING ELONGATED ARTICLES

Paul Truninger, Industriestr. 9, CH-Langendorf/Solothurn, Switzerland

Filed Jul. 19, 1984, Ser. No. 632,410

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326152; Mar. 16, 1984, 3409780

Int. Cl.[4] B65B *35/50, 35/30, 35/44, 5/10*

U.S. Cl. 53—447 **40 Claims**

1. Apparatus for loading elongated articles between first and second stations, comprising:

first transport means for simultaneously lifting the elongated articles from said first station and conveying them along a predetermined path to an intermediate station;

adjusting means cooperating with said first transport means for aligning the elongated articles and forming a layer of contacting articles of predetermined width at said intermediate station;

second transport means for lifting said formed layer of elongated articles from said intermediate station, said second transport means defining a support surface upon which said layer of elongated articles is arranged when being lifted from said intermediate station and conveyed to said second station; and

means for depositing at least one intermediate layer onto said support surface before said second transport means picks up said formed layer of elongated articles to transfer the latter from said intermediate station to said second station.

4,679,382

RIDING TYPE MOWER

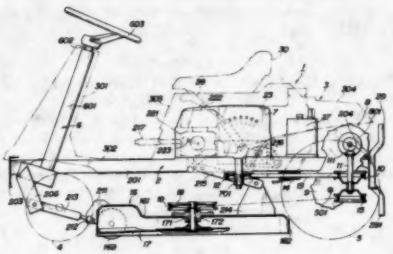
Kazuo Saruhashi, Saitama; Masato Ara, Chiba; Takanori Suzuki, Saitama; Gunji Saito, Saitama, and Atsushi Kojima, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,117

Claims priority, application Japan, Aug. 27, 1984, 59-179135; Aug. 27, 1984, 59-179136; Aug. 27, 1984, 59-179137; Jan. 22, 1985, 60-9544

Int. Cl.[4] A01D *55/18, 35/24*

U.S. Cl. 56—10.1 **12 Claims**



1. A riding type mower comprising:

a vehicle body;

a front wheel steerably arranged in the front part of the vehicle body;

a rear wheel drivably arranged in the rear part of the vehicle body;

a mower cutting means including a housing disposed under vehicle body;

a driver seat disposed on said vehicle body;

an engine operatively interconnected with, to drive, said rear wheel and said mower cutting means;

an engine output shaft downwardly extending from said engine, said engine output shaft having a drive pulley fixed thereon;

a transmission gearing for said rear wheel, said transmission gearing being disposed behind an axle of said rear wheel, said transmission gearing having a downwardly extending input shaft provided with an upper pulley and a lower pulley being fixed thereon, said upper pulley and said lower pulley being both disposed behind said axle of said rear wheel;

a cutter drive pulley for driving said mower cutting means, said mower cutting means being disposed substantially at the center part of said vehicle body;

a drive belt for interconnecting said drive pulley on said engine output shaft with said upper pulley on said input shaft of said transmission gearing;

a drive belt for interconnecting said lower pulley on said input shaft and said transmission gearing on said cutter drive pulley, wherein said mower cutting means is to be level-adjustable;

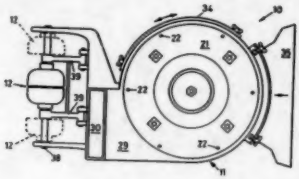
a fuel supply system consisting of a fuel feed equipment and a fuel tank; and

an exhaust system consisting of an exhaust pipe and a muffler, wherein said driver seat is disposed substantially at the longitudinal central part of said vehicle body, said engine being disposed directly below said driver seat, said fuel supply system being disposed at one side of said engine, said exhaust system being disposed at the other side of said engine and said cutter means and housing, said engine and said driver seat being disposed substantially ath the longitudinal central part of the vehicle body, and within the contour of the cutter housing as viewed from above.

4,679,383
LAWN EDGER

Francis W. Quintel, Allenby Gardens, Australia, assignor to Robert Douglas Sheehan, South Australia, Australia

PCT No. PCT/AU85/00031, § 371 Date Oct. 21, 1985, § 102(e) Date Oct. 21, 1985, PCT Pub. No. WO85/03620, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 22, 1985, Ser. No. 797,679
Claims priority, application Australia, Feb. 24, 1984, PG3784
Int. Cl.[4] A01D *34/84*
U.S. Cl. 56—13.4 10 Claims

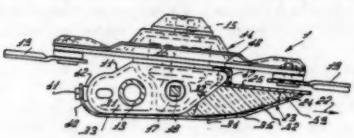


1. A lawn edger comprising a hollow frame,
ground engaging wheels supporting the frame,
a motor carried by the frame having a rotor with a vertical axis of rotation,
an axle extending transversely of the frame rearwardly of said axis of rotation, a pair of half-wheels rotatable and slidable on the axle, spacer means co-operable with the half wheels to retain them contiguous with one another in a central longitudinal plane of the frame, or spaced from one another adjacent the lateral sides of the frame,
fan and cutter assembly within the hollow frame said fan and cutter assembly comprising a plurality of fan blades which extend outwardly from the axis of rotation in generally radial planes, and a plurality of cutting blades beneath the fan blades and which extend axially downwardly and radially outwardly from the axis of rotation,
one of said ground engaging wheels being rotatably mounted with respect to said frame at a central location with respect to said axis of rotation,
and means coupling the rotor to the fan and cutter assembly for driving the latter.

4,679,384
MOWING MACHINE

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 489,000, Apr. 27, 1983, abandoned.
This application Dec. 31, 1984, Ser. No. 687,494
Int. Cl.[4] A01D *34/44*
U.S. Cl. 56—13.6 42 Claims

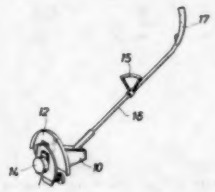


1. A mowing machine comprising:
a cutting member;
a supporting member for said cutting member, said supporting member comprising on its lowest side a flat part;
a supporting skid for bearing on the ground to support at least part of the weight of the machine during operation, a rear portion of said supporting skid bearing against said flat part over substantially the latter's entire area for carrying said supporting member, a forward portion of said supporting skid extending forward of said supporting member, said forward portion diverging rearwardly;
a space defined at least in part by the supporting skid between the forward portion of said supporting skid and said supporting member; and
a body of lightweight filling material occupying a substantial portion of said space and establishing an effective connection betweeen said supporting skid and said supporting member.

4,679,385
ATTACHMENT FOR LAWN TRIMMER

Benjamin C. Carmine, 415 Shadow Creek Dr., Seabrook, Tex. 77586

Filed Dec. 23, 1985, Ser. No. 812,757
Int. Cl.[4] A01D *34/84*
U.S. Cl. 56—16.9 9 Claims



1. An attachment for converting a lawn trimmer into a lawn edger trimmer, the lawn trimmer including a housing enclosing a motor, a shield plate integrally formed with the motor housing and a spool and line housing projecting outwardly from the motor housing substantially perpendicular to the shield plate, the attachment comprising:
(a) a base plate detachably mounted to the motor housing in substantial planar contact with the motor housing shield plate, said base plate including a hole for receiving the spool and line housing therethrough;
(b) a deflection shield extending along an arcuate edge of said base plate, said deflection shield being integrally formed with said base plate and protruding outwardly therefrom, said deflection shield defining a curved surface projecting from said base plate for deflecting grass clippings and debris outwardly from said base plate;
(c) an edge guide depending downwardly from a bottom edge of said base plate for guiding the lawn trimmer along the path;
(d) bracket means mounted to said base plate for receiving a nose portion of the lawn trimmer housing therein;
(e) wheel means mounted to said bracket means and said base plate for rolling the lawn trimmer along the a path; and
(f) means for mounting said base piate to the lawn trimmer housing.

4,679,386
HARVESTER FOR THE IMPACT-STRIPPING OF SEED FROM A STANDING CROP

E. Cordell Lundahl, Logan, Utah; Neil L. West, Bettendorf, Iowa, and Homer D. Witzel, Englewood, Fla., assignors to Deere & Company, Moline, Ill.

Filed May 7, 1982, Ser. No. 375,838
Int. Cl.[4] A01D *45/00, 41/00*
U.S. Cl. 56—126 12 Claims

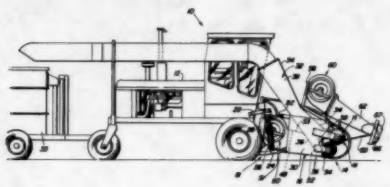
1. A harvesting machine for stripping seeds from seed-bearing heads n a standing crop while essentially leaving the stems of the crop attached to the soil and comprising:

a mobile main frame adapted to advance over a field of the standing crop;

a vertically adjustable harvesting header carried by the main frame;

a first axially transverse rotor mounted on the header with its axis generally below the level of substantially all the seed-bearing heads on the standing crop and including a hub and outwardly projecting stripper means whose outer ends define the rotor periphery whereby the rotor generates a cylinder as it rotates, the stripper means defining longitudinally spaced openings on the rotor periphery of a width ggreater than upper seed-bearing heads into the rotor interior as the machine advances so that the heads are impacted of angulated sides of the stripper means interiorly of the outer end thereof;

a second axialy transverse rotor disposed parallel to, above



and forwardly of the first rotor anbd having a generally cylindrical outer periphery adjacent the periphery of the first rotor, the axis of the second rotor being generally above the level of substantially all the seed-bearing heads on the standing crop;

means for driving the rotor in opposite directions at perpheral speeds greater than 18 m/sec with the front side of the first rotor moving upwardly and the front side of the second rotor moving downwardly, the first rotor being driven so that the angulated sides of the stripper means impact the seed-bearing heads disposed within the openings in the rotor in a generally stem-wise direction to knock the seeds from the heads and to propel them rearwardly from the rotor; and

crop collection means mounted on the header behind the rotors and adapted to receive the seeds propelled rearwardly from the rotors.

4,679,387

REINFORCING CORD WITH WRAPPING WIRE

Wolfgang Weidenhaupt, Erkelenz, and Peter Dismon, Heinsberg-Proselen, both of Fed. Rep. of Germany, assignors to AKZO NV, Arnhem, Netherlands

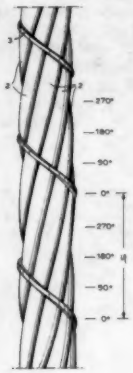
Continuation of Ser. No. 610,877, May 16, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 807,767

Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317744

Int. Cl.[4] D02G *3/48;* **B60C** *9/00;* **D07B** *1/06*

U.S. Cl. 57—212 **5 Claims**

1. A reinforcing cord made of at least one strand of steel wires for reinforcing the elastomeric carcass of a cord tire, comprising at least one flat wrapping wire of metal wound helically on the strand and forming the outermost layer of the reinforcing cord, the hardness of the flat wrapping wire being between 30% to 60% of the hardness of the steel wires, the flat wrapping wire having a rectangular cross-section whereby the longer side of the cross-section of the flat wrapping wire is in contact with the steel wires, and the ratio of the shorter side to



the longer side of the cross-section of the flat wrapping wire is between 0.4 and 0.7.

4,679,388

PROCESS AND APPARATUS FOR FRICTION SPINNING

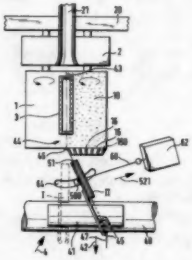
Peter Artzt; Hans Rottmayr, and Wolfgang Bauer, all of Reutlingen, German Democratic Rep., assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 797,816

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441678

Int. Cl.[4] D01H *7/882, 15/02*

U.S. Cl. 57—263 **15 Claims**



1. A process for friction spinning, in which fibers are twisted together to form a thread in a V-shaped nip formed by rotation of two frictional elements driven in the same direction, comprising:

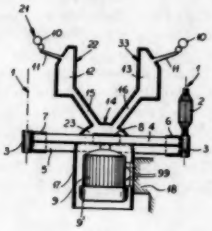
piecing such thread by returning formed thread to the vicinity of the rotating frictional elements, but deflected from a straight thread formation line parallel with the V-shaped nip; and then placing said thread into said thread formation line; and

commencing spinning thread from fibers by feeding such fibers to the rotational frictional elements and drawing off said thread along said thread formation line, thereby deflecting said thread from a plane defined through such thread formation line and perpendicular to the plane of the rotation axes of the frictional elements, wherein such deflection includes directing the thread with controllable force into at least one peripheral edge of the frictional elements having enhanced frictional engagement characteristics, whereby improved twisting take-up results.

4,679,389
SPINNING OR TWISTING MACHINE

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ubersbach-Fils, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,838
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504976
Int. Cl.[4] D01H *5/66, 3/16*
U.S. Cl. 57—304 **4 Claims**



1. A spinning machine comprising:

a spinning frame provided with:

a plurality of groups of upright spinning spindles having respective whorls and disposed in at least one row,

respective drive belts tangentially engaging the whorls of each group for driving the respective spindles, and

a respective electric motor having a vertical motor shaft for each of said groups drivingly coupled to the respective drive belt thereof;

a drafting frame above said spindles and provided with drafting rolls defining a drafting station at each spindle for drafting respective rovings to be fed to said spindles for spinning thereby, said drafting stations being arrayed along said row;

a suction duct extending all along said row above said spindles and formed with suction pipe fittings reaching from said duct toward each of said stations for sucking roving fragments into said duct;

a suction source connected with said duct for generating suction therein;

respective downwardly open bell shaped housings extending over each of said motors; and

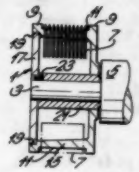
means connecting each of said housings to said duct at locations spaced therealong for drawing heat from said motors and preventing spinning variations at spindles of each group dependent upon the proximity of the respective spindles to the respective motor.

4,679,390
OPENING ROLLER ASSEMBLIES FOR OPEN END SPINNING MACHINES

William R. Stewart, Strathmartine, Scotland, assignor to Wm. R. Stewart & Sons (Hacklemakers) Limited, Scotland

Filed Feb. 20, 1986, Ser. No. 831,437
Claims priority, application United Kingdom, Feb. 22, 1985, 8504595
Int. Cl.[4] D01H *7/895*
U.S. Cl. 57—408 **13 Claims**

1. An opening roller assembly for an open end spinning machine comprising a drive shaft mounted for rotation in a bearing forming part of or fitted to the machine and an opening roller having a circumferential surface which may be pinned or wrapped with flexible saw-toothed wire, said roller forming a close sliding fit on the drive shaft, and including a non-mechanical force means restraining at least part of said roller in the axial direction of said drive shaft in an operating position on said shaft to allow easy removal of at least part of said roller from said shaft and further including mechanical drive means

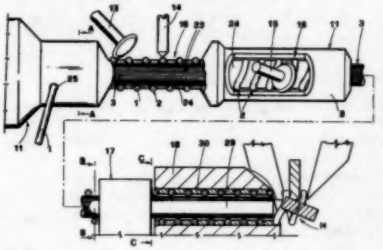


to impart rotation of said shaft to said roller when said roller is in said operative position.

4,679,391
METHOD OF MANUFACTURING JEWELRY CHAINS FROM DECORATED HELICOID MEMBERS AND/OR LINKS

Valtiero Tizzi, Via Clementini 2, 47037 Rimini (Forli), Italy

Filed Sep. 30, 1985, Ser. No. 782,040
Claims priority, application Italy, Nov. 14, 1984, 3623 A/84
Int. Cl.[4] B21L *7/00;* **B21F** *3/04*
U.S. Cl. 59—20 **5 Claims**



1. Method for the automatic decoration of helicoid members and/or links from which to fashion chain-type articles of jewelry in precious metal, and of costume jewelry, comprising the following steps:

a—feeding a wire uncoiled from an interchangeable clutch-driven supply reel;

b—straightening the wire;

c—forming at least one guide groove on and along at least one straight line generator of the wire;

d—milling the wire transverse to its axis and along one of its straight line generators to avoid subsequent twisting, guiding the wire by way of the grooves before and after such milling;

e—winding the wire into a helicoid around a small diameter former having a splined profile and interlocking the milled surface formed in the wire with the splined profile; supporting the former bilaterally to bear strains from the decoration tools;

f—crafting and decorating the wire while still wound helicoidally around the former;

g—shaping of each turn of the helicoid to the cross-sectional shape of the former;

wherein said guiding is introduced immediately before said winding in order to avoid twisting the wire, and said milling produces single cuts forming the milled surface produced on the wire which are angled in relation to the axis of the wire to a degree β which is equal to the lead angle of the helicoid in relation to the former;

and the further step of:

h—forming a link from the end-most turn of the helicoid, and connecting the link thus formed with the supervening end-most turn of the helicoid;

wherein the feeding of the wire is regulated to follow the lead of the helicoid, and advancing and retracting the former at each such operation through a distance equal to the pitch of the helicoid takes place, the advancing of the former being accompanied by a spin movement, the retracting of the former being a straight line translation with no rotation of the former.

4,679,392

PROCESS FOR PRODUCING A GARLAND CHAIN

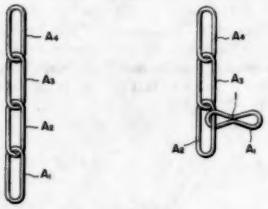
Shigesaburo Nakagawa, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 774,844, Sep. 11, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 873,917

Claims priority, application Japan, Jul. 1, 1985, 60-144146

Int. Cl.[4] B21L *11/00*

U.S. Cl. 59—35.1 **14 Claims**



1. A process for producing a garland chain comprising the steps of:

(a) forming a chain comprising a plurality of connected links, including a plurality of long links, said long links having a length at least twice their width;

(b) moving a first link attached to a long link of said chain to an end of said long link to be adjacent to a second link attached to said long link at said end;

(c) deforming said long link at a medial portion thereof so as to prevent movement of said first and second links away from said end of said long link; and

(d) repeating said moving and deforming steps with respect to additional long links of said chain.

4,679,393

PRESSURE WAVE MACHINE OPERATING AS PRESSURE EXCHANGER, IN PARTICULAR FOR USE AS THE HIGH-PRESSURE COMPRESSOR FOR GAS TURBINES

Jaan Hellat, Rüthihof-Baden, and Jakob Keller, Dottikon, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 26, 1985, Ser. No. 780,202

Claims priority, application Switzerland, Sep. 28, 1984, 4670/84

Int. Cl.[4] F02C *3/02*

U.S. Cl. 60—39.45 **3 Claims**

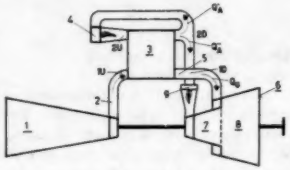
1. In a pressure wave machine operating as a pressure exchanger, in particular for use as a high pressure compressor for gas turbines, comprising a rotor casing, at least one cell rotor located within the rotor casing, a control casing flanged onto each of the two end faces of the rotor casing, which control casings close off the rotor casing at its two end surfaces, each control casing at the end surfaces of the rotor casing having at least one high pressure driving gas inlet port and one low pressure air inlet port and one low pressure driving gas outlet port and one high pressure air outlet port, respectively, a pressure exchanger combustion chamber for generating high pressure driving gas and connected to the high pressure driving gas port, the pressure exchanger combustion chamber connected to the high pressure air port to which is branched off a part of the high pressure air in the pressure exchanger combustion chamber for burning fuel intended for the pressure exchanger combustion chamber, with the rest of the high pressure air being available for combustion in another combustion chamber, the improvement wherein:

a closing edge of the low pressure air port, as viewed in the direction of rotation of the cell rotor, is located ahead of a closing edge of the low pressure driving gas port,

the condition $A-D>B$ applies to the casing geometry, where A is the distance between an opening edge of the low pressure driving gas port and the closing edge of the low pressure driving gas port, D is the distance between the opening edge of the low pressure driving gas port and an opening edge of the low pressure air port, and B is the length of the low pressure air port,

the lengths A, B and D being measured in a cylindrical section situated at half the height of the cells,

the opening edge of the low pressure driving gas port, as viewed in the direction of the peripheral velocity of the



cell rotor, being located ahead of an opening edge of the low pressure air port,

the inlet ports for the high pressure driving gas and the low pressure air are located in one of the two control casings, and the outlet ports for the high pressure air and the low pressure driving gas are located in the other casing,

the following relationships exist between the length (L) of the cells of the cell rotor, the distance (d) between the opening edge of the high pressure driving gas port and the opening edge of the high pressure air port, the length (a) of the high pressure driving gas port, the length (b) of the high pressure air port, the distance (A) between the opening edge of the low pressure driving gas port and the closing edge of the low pressure driving gas port, the distance (D) between the opening edge of the low pressure driving gas port and the opening edge of the low pressure air port, the length (B) of the low pressure air port and the velocity parameters determining the pressure wave process, said quantities d, a, b, A, D and B being measured in a cylindrical section located at half the height of the cells:

$$\frac{V}{u_3} = \frac{d}{L},$$

$$\frac{V}{u_2} = \frac{b+d}{L},$$

$$\frac{2V}{c_{2U}+u_2+2l} = \frac{b+d-a}{L},$$

$$\frac{2V}{c_{2l}+c_{1D}-u_1} = \frac{D}{L},$$

$$\frac{V}{u_1} = \frac{A-D}{L}, \text{ and}$$

$$\frac{2V}{c_{1U}+u_1+c_{1l}} = \frac{A-B-D}{L}$$

where

v is the velocity of the rotor cells relative to the casing,

u_r is the propagation velocity of the shock wave,

u is the flow velocity of the media, relative to the cells, at the ends of the charging zone and the scavenging zone, and

c is the sonic velocity,

where the indices 2U and 1D refer to the high pressure driving gas and the low pressure driving gas, respectively, and the index 1U refers to the low pressure air; furthermore, the indices 1 and 2 refer to low pressure and high pressure, respectively, the index 21 refers to the expansion range of the driving gas and the index 12 refers to the compression range of the air.

4,679,394

GAS TURBINE ENGINE POWER PLANT

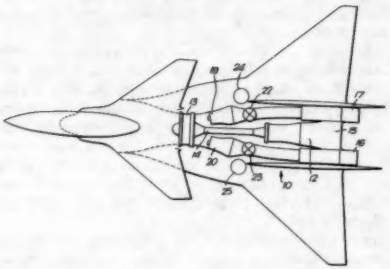
Maurice I. Taylor, Allestree, England, assignor to Rolls-Royce plc, London, England

Filed Apr. 24, 1979, Ser. No. 33,093

Claims priority, application United Kingdom, May 30, 1978, 24115

Int. Cl.[4] F02K *3/12*

U.S. Cl. 60—224 **7 Claims**



1. A gas turbine power plant for a V.T.O.L. or S.T.O.L. aircraft comprising:

a main gas turbine engine for the aircraft;

a main engine exhaust nozzle assembly for receiving and discharging a portion of exhaust gases form said main gas turbine engine rearwardly of the aircraft;

at least one auxiliary gas turbine engine;

at least one auxiliary exhaust nozzle assembly, said auxiliary exhaust nozzle assembly including an innermost nozzle portion for discharging exhaust gases from said at least one auxiliary gas turbine engine rearwardly of the aircraft and an outermost nozzle portion for discharging a remaining portion of exhaust gases from said main gas turbine engine rearwardly of the aircraft;

at least one vertically arranged exhaust nozzle operatively connected to said at least one auxiliary gas turbine engine for discharging exhaust gases therefrom vertically downward; and

means selectively operable to discharge exhaust gases from said at least one auxiliary turbine engine to said innermost nozzle portion of said at least one auxiliary exhaust nozzle assembly in a first mode of operation and to said vertically arranged exhaust nozzle in a second mode of operation.

4,679,395

CLEANING MEANS FOR VEHICLE EXHAUSTING PIPE

A- Lin Ou, No. 27, Wen Hue Road, Chung Yan Li, Chung Li City, Taiwan

Filed Oct. 25, 1984, Ser. No. 664,606

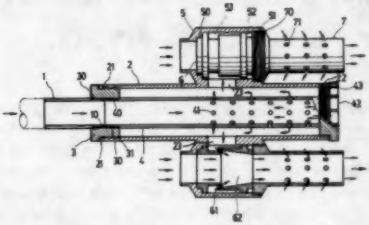
Int. Cl.[4] F01N *1/14, 3/30*

U.S. Cl. 60—319 **13 Claims**

1. In a multi-component exhaust assembly adapted to be connected at the exhausting pipe of a vehicle, including an acceleration cylinder with an air inlet terminus and an outlet terminus remote from said air inlet terminus, said acceleration cylinder comprising:

a walled housing defining a passage in said acceleration cylinder between said air inlet terminus and said outlet terminus thereof;

a hollow cylindrical body, with said hollow cylindrical body having two spaced cylindrical circumferential flanges for seating it in said housing at the walls thereof thereby forming a chamber for receiving exhaust gases from said



exhausting pipe; said hollow cylindrical body defining an interior nozzle formation tapering in the direction of the outlet terminus of said acceleration cylinder and said nozzle formation being connected to said air inlet terminus for receiving atmospheric air during operation of the respective vehicle; and

walled passage means for connecting said chamber for receiving exhaust gases and said interior nozzle with concomitant admixture of air during operation of the respective vehicle.

4,679,396

ENGINE CONTROL SYSTEMS

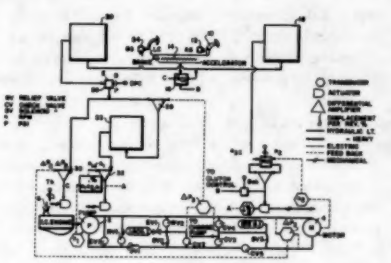
William S. Heggie, 74 Woodfield Drive, Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 385,438, Jun. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 099,984, Dec. 3, 1979, abandoned. This application Jan. 9, 1984, Ser. No. 569,157

Claims priority, application Canada, Dec. 8, 1978, 317645

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—414 **3 Claims**



1. A system for transmitting the output of an engine to a load in response to a driver's pressure on an accelerator pedal or on a brake pedal including

(a) a first swash plate device mechanically coupled to said engine and operable in accordance with a first algebraic expression,

(b) a second swash plate device having a controllable swash plate and operable in accordance with a second algebraic expression,

(c) the first and second swash plate devices being each capable of independent control and each capable of operating as either a hydraulic pump or a hydraulic motor, a hydraulic system having a first and second line interconnecting said first and second swash plate devices to thereby control the engine speed in accordance with a function of at least one of said algebraic expressions,

(d) a parallel by-pass hydraulic line across said first swash plate device between said first and second hydraulic lines,

(e) a check valve connected in said parallel by-pass hydraulic line,

(f) another check valve connected in said second hydraulic line,

(g) a high pressure accumulator unit,

(h) a first solenoid valve arranged when open to connect the output of said accumulator unit to the junction of said first swash plate device and said by-pass hydraulic line in said second hydraulic line, said junction being on one side of said other check valve remote from said second swash plate device, whereby in operation, said accumulator unit discharges to the input side of said first swash plate device,

(i) a second solenoid valve connected between said accumulator unit and said second hydraulic line,

(j) control circuits for activating said first solenoid valve and said second solenoid valve,

(k) a reservoir unit connected to said second hydraulic line on the other side of said other check valve,

(l) where the first algebraic expression is

$$\Delta P_c - \Delta P_3$$

and the second algebraic expression is A_p where

ΔP_c=Pressure command function,

ΔP_3=Accumulator pressure difference ($P_4 - P_3$),

A_p=Throttle potentiometer setting,

P_3=Motor outlet pressure

P_4=Inlet pressure,

(m) wherein in operation with said accumulator charged up, said driver's pressure activates said control circuits to cause said first and second solenoid valves to open and permit accumulator pressure to be applied through them to said first-mentioned check valve to cause it to open to apply said accumulator pressure through it to the first hydraulic line and to the second swash plate device, said other check valve being automatically closed by said accumulator pressure to prevent fluid-flow therethrough, the accumulator fluid flow being in parallel with the fluid flow from the first swash plate device,

(n) wherein, in operation with said accumulator pressure depleted and said driver's pressure requiring a greater pressure than said accumulator pressure can provide, said first-mentioned check valve is automatically closed by the pressure from said first swash plate device to said first hydraulic line to prevent fluid flow therethrough, whereby said accumulator fluid flow is automatically placed in series with the fluid flow from said first swash plate device,

(o) wherein, in operation in a braking action of said load, the driver's pressure on said brake pedal activates said control circuits to close said first solenoid valve and open said second solenoid valve to permit fluid pressure from said second swash plate device to automatically charge up said accumulator and store surplus pressure representing kinetic energy of deceleration in said accumulator unit.

4,679,397

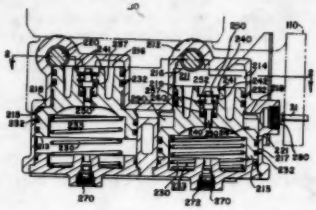
HYDRAULIC POWER BRAKE APPARATUS

Raymond Kosarski, Jr., Niles, Mich., and Robert W. Jackson, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 15, 1985, Ser. No. 787,817

Int. Cl.[4] B60T *11/20, 13/58, 17/00;* **F15B** *3/00*

U.S. Cl. 60—562 **5 Claims**



1. A power braking apparatus for a vehicle, comprising:

a single master cylinder and a reservoir, the master cylinder having two pressure chambers with respective fluid pressure outlets;

a fluid power apparatus connected with the master cylinder and comprising a housing, an input rod, a first chamber and a work chamber divided by a power piston, a spring biasing said power piston, a fluid power inlet communicating with said work chamber, a fluid power outlet communicating with said first chamber, passage means through said power piston, valve means connected to said input rod and controlling fluid flow through said passage means, and a fluid pressure outlet line from said working chamber; and

a pair of fluid displacement multipliers each of which comprises at least one stepped housing chamber connected directly to a respective fluid pressure outlet of the single master cylinder, the housing chamber having a stepped portion between small and large diameter sections, a differential area piston having a shoulder between small and large diameter portions of the piston, poppet valve means associated with said differential area piston, an outlet to an associated brake circuit and for communicating fluid pressure received from the large diameter section of said housing chamber, and the fluid pressure outlet line of the fluid power apparatus providing fluid pressure to each multiplier which has a variable volume chamber defined by the shoulder and small diameter portion of the differential area piston and stepped portion of said housing chamber.

4,679,398

VARIABLE CAPACITY TURBOCHARGER CONTROL DEVICE

Fumio Nishiguchi; Masato Noguchi, both of Yokohama, and Keiji Hatanaka, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 27, 1985, Ser. No. 706,278

Claims priority, application Japan, Feb. 29, 1984, 59-36105

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **10 Claims**

1. A device for controlling a turbocharger having a compressor and a turbine coupled to the compressor, said device comprising:

means for determining the supercharge pressure of air from said compressor;

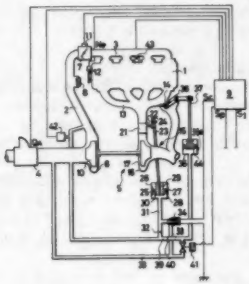
variable capacity means for varying the flow rate of exhaust gas introduced into the turbine in a low speed state of an engine connected to the turbocharger, said variable capacity means responsive to a first control signal;

exhaust gas bypass means for controlling the flow rate of the

exhaust gas bypassing said variable capacity means and said turbine in a high speed state of the engine, said bypass means responsive to a second control signal;

a control means, responsive to operating parameters of said engine, for generating said first and second control signals; and

said control means including means for detecting an acceler-



ation state of the engine and responsive to said determined supercharge pressure and generating said second control signal for controlling the operation of the exhaust gas bypass means such that the exhaust gas bypass means reduces the flow rate of the exhaust gas introduced into the turbine only when the determined supercharge pressure has reached a predetermined pressure in an acceleration state of the engine.

4,679,399

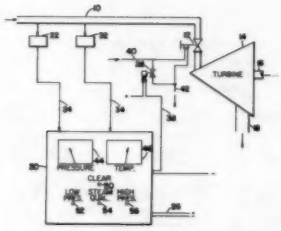
PROTECTION SYSTEM FOR STEAM TURBINES INCLUDING A SUPERHEAT MONITOR

Roger D. Strickler, Mt. Pleasant, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Sep. 13, 1985, Ser. No. 775,875

Int. Cl.[4] F01K *13/02*

U.S. Cl. 60—646 **8 Claims**



1. A protection system for a steam-driven turbine for assuring operation of the turbine only when the driving steam is superheated, said turbine including trip means for interrupting the supply of steam to the turbine, which comprises:

pressure sensing means mounted to sense the pressure of the driving steam and to generate a pressure signal indicative of said presure;

temperature sensing means mounted to sense the temperature of the driving steam and to generate a temperature signal indicative of said temperature;

logic means connected to receive the pressure signal and the temperature signal, said logic means including signal conditioning means for adjusting the value of the temperature and pressure signals;

comparator means connected to receive the temperature signal and the pressure signal after they have been conditioned and for generating an output fault signal when the absolute value of the conditioned pressure signal exceeds the absolute value of the conditined temperature signal; and

energization means connected to receive the fault signal and in response thereto to energize the trip means to interrupt the flow of steam to the turbine.

4,679,400

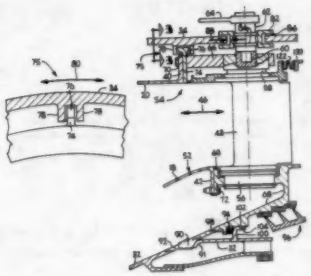
VARIABLE TURBINE VANE SUPPORT

James S. Kelm, Milford; Harvey M. Maclin; Edward C. Vickers, both of Cincinnati, and Thomas G. Wakeman, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 561,756, Dec. 15, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,678

Int. Cl.[4] F02C *1/00*

U.S. Cl. 60—722 **8 Claims**



1. In a gas turbine engine including an annular combustor with inner and outer combustor walls, an annular casing with inner and outer casing walls bounding said combustor, and a variable vane array with a plurality of vanes located aft of said combustor, the improvement comprising:

support means for supporting said variable turbine vane array including axial attachment means for attaching said array to said combustor wall so that substantially all of the axial load on said array is transmitted through said combustor walls.

4,679,401

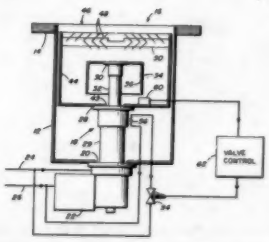
TEMPERATURE CONTROL OF CRYOGENIC SYSTEMS

Philip A. Lessard, Acton; Allen J. Bartlett, Milford, and John F. Peterson, Lynnfield, all of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Jul. 3, 1985, Ser. No. 752,354

Int. Cl.[4] B01D *8/00*

U.S. Cl. 62—55.5 **30 Claims**



1. A cryogenic refrigerator comprising:

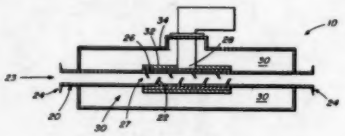
a refrigerator heat sink;
a source of refrigerant gas under pressure;
gas expansion means including a reciprocating piston in a cylinder for expanding the refrigerant gas in a gas expansion space within the cylinder to cool the gas and the refrigerator heat sink to cryogenic temperatures;
means for selectively diverting refrigerant gas away from the gas expansion means; and
a heat exchanger in thermal communication with the refrigerator heat sink for receiving diverted refrigerant gas and conducting heat from the refrigerant gas into the refrigerator heat sink to warm the heat sink while keeping the diverted gas out of fluid communication with the gas expansion space.

4,679,402

COOLING HEAT EXCHANGER

Bruce R. Andeen, Acton, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Aug. 11, 1986, Ser. No. 895,268
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **20 Claims**



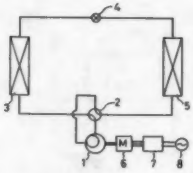
1. A cooling heat exchanger assembly, comprising:
a. a flow through conduit of low thermal conductivity material;
b. an optically dense center portion of the conduit;
c. a container surrounding the conduit such that an insulating volume filled with solid insulation is created between the conduit and the container; and
d. a cryogenic refrigerator having a piston which reciprocates in a cylinder to expand and thus cool gas in an expansion space at the end of the cylinder, the cylinder extending through the container such that its cold end is in thermal contact with the conduit.

4,679,403

HEAT PUMP APPARATUS

Yuji Yoshida, Itami; Shigeo Suzuki, Hirakata; Kazuo Nakatani, Moriguchi; Yuji Mukai, Kadoma; Akira Nakazawa, and Takumi Imoto, both of Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 5, 1985, Ser. No. 772,887
Claims priority, application Japan, Sep. 6, 1984, 59-186707; May 14, 1985, 60-103472
Int. Cl.[4] F25B *13/00*
U.S. Cl. 62—114 **6 Claims**



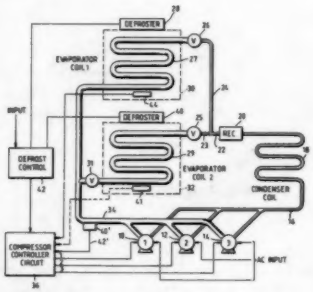
1. A method for operating a heat pump that includes:
a refrigeration circuit comprising and operatively connecting:
(a) a variable-r.p.m. compressor;
(b) a primary heat exchanger for a heat sink;
(c) a capillary tube or expansion valve; and
(d) a secondary heat exchanger for a heat source,
so as to lower the discharge temperature of the compressor at times when the compressor is being operated at speeds in excess of that at which said compressor would be operated by an electric motor powered directly by alternating electric current of supplied hertz, in comparison with the discharge temperature of the compressor if said heat pump were using a single constituent refrigerant as the refrigeration circuit working fluid,
said method comprising:
operating said compressor at said speeds in excess, while using a constant-composition multiple-constituent refrigerant as the refrigeration circuit working fluid, said constant composition multiple-constituent refrigerant being one selected from the group consisting of:
(i) at least 50 percent by weight of R22, and at least one minor constituent refrigerant selected from the group consisting of R23, R13, R116, SF6, R13 B1, R125, R12, R152*a*, R124, R142*b*, RC318, R12B1, R14, R133*a* and R11; and
(ii) at least 50 percent by weight of R12, and at least one minor constituent refrigeraant selected from the group consisting of R13, R116, SF6, R13 B1, R125, R115, R218, R124, R142*b*, RC 318, R114 and R133*a*.

4,679,404

TEMPERATURE RESPONSIVE COMPRESSOR PRESSURE CONTROL APPARATUS AND METHOD

Richard H. Alsenz, 1545 Industrial Rd., Missouri City, Tex. 77489

Continuation of Ser. No. 742,985, Jun. 10, 1985, abandoned, and a continuation-in-part of Ser. No. 706,403, Feb. 27, 1985, Pat. No. 4,628,700, which is a continuation of Ser. No. 458,914, Jan. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 257,113, Apr. 24, 1981, Pat. No. 4,612,776, which is a continuation of Ser. No. 62,525, Jul. 31, 1979, abandoned. This application Feb. 28, 1986, Ser. No. 835,449
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—175 **34 Claims**



1. A compressor controller circuit for use in a multiple compressor cooling system, said controller circuit having a control means including a means adapted to select either the operating suction line pressure or to the temperature of an area to be cooled as a system parameter for controlling the cycling of said compressors on and off in a sequence to select a combination of said compressors to provide the minimum compressor capacity sufficient to obtain an average operating system parameter in the range defined from an upper to a lower operating limit, said controller further including a means responsive to the temperature of an area to be cooled by a system evaporator coil for dynamically adjusting said upper and lower operat-

ing limits to obtain a combination of said compressors having the minimum system compressor capacity required to maintain said area temperture at a desired level.

4,679,405

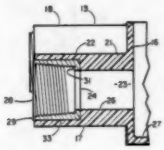
MOLDED DRAIN CONNECTION WITH INSERT

Charles A. Mitchell, Indianapolis, Ind.; Thaddeus J. Wawro, Auburn, N.Y.; Charles E. Whipple, Brewerton, N.Y., and William E. Wright, Sr., East Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,991

Int. Cl.[4] F25D *21/14*; F16L *33/00*

U.S. Cl. 62—285 **10 Claims**



1. In a plastic condensate collection pan for use with an air conditioning system of the type having an evaporator coil which tends to form condensation on its outer surface, a discharge conduit and an associated coupling device for threadably connecting to a drainage pipe comprising:

a plastic cylindrical conduit extending from a wall of the condensate pan and defining an axial opening therefrom;

a cylindrical metal insert disposed in said axial opening and secured to said discharge conduit to prevent rotation of said insert when a torque is applied about its axes; and

said insert having a threaded portion to which a discharge pipe can be connected.

4,679,406

HEAT-INSULATING WINDOW

Rolf-Diether Weiblen, Eltener Strasse 1, D-4330 Mülheim/-Ruhr, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,841

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341485; European Pat. Off., Feb. 22, 1984, 84101824.5; Jul. 28, 1984, 84108985.7

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—262 **12 Claims**

1. A heat-insulating window for closing window openings in buildings which comprises

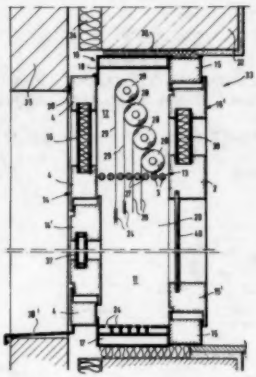
an installation frame adapted to be incorporated into a wall structure of a building, said installation frame containing means for mounting profiles containing lateral guide slots which extend vertically for engaging the borders of curtain webs, said profiles being mounted so that the curtain webs laterally extend beyond the window opening,

an outer facing frame adapted to be secured to the outer side of the installation frame and defining a window opening,

an inner facing frame adapted to be secured to the inner side of the installation frame and containing a removable auxiliary frame, said outer facing frame and said inner facing frame defining a first auxiliary chamber and a window chamber disposed therebetween, said auxiliary chamber being disposeed above said window chamber and separated therefrom by an intermediate wall which contains slots for the passage of curtain webs therethrough,

at least one glass pane disposed in said window opening in front of said window chamber, and

roller means containing curtain webs disposed in said auxiliary chamber, said curtain webs being extendable across



said auxiliary chamber, through the slots in said intermediate wall and across said window chamber.

4,679,407

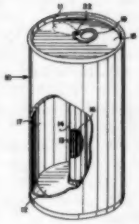
BEVERAGE CONTAINER WITH ENCLOSED COOLING MEANS

Ho K. Kim, 162-1, Hongjae 1-dong, Sudaemun-ku, Seoul, and Seung E. Choi, Samho Garden Mansion Apartment, Block 8, Rm 808, 444-1, Banpo 1-dong, Kangnam-ku, Seoul, both of Rep. of Korea

Filed Dec. 10, 1985, Ser. No. 807,444

Int. Cl.[4] F25D *3/10*

U.S. Cl. 62—294 **4 Claims**



1. A beverage container with an enclosed cooling system which comprises:

a beverage container provided with a container top and containing a cooling system disposed within said container, said cooling systems comprising,

a cooling tank adapted to contain a pressurized liquid cooling agent and disposed within said container in the lower portion thereof,

a conduit means extending through the container from the cooling tank to the top of the container, and defining a chamber therein, and

pipe means disposed within the conduit means and having a serpentine configuration, said pipe means communicating at one end with the cooling tank and at the other end with the chamber of the conduit means, said other end having a reduced-size portion, said container top being provided with a removable panel portion having an opener attached to the outside surface thereof, whereby, upon the initial opening of the removable panel, the chamber of the con-

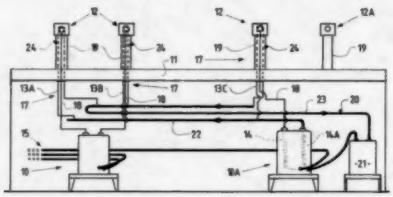
duit means is exposed to the environment and the pressurized liquid cooling agent immediately expands from the reduced-size end portion disposed at the lower end portion of the conduit means to cool the contents of the container.

4,679,408

DISPENSING AND COOLING APPARATUS

James L. Nelson, P.O. Box 821, Gold Coast, Queensland, Australia (4220)

Filed Feb. 11, 1986, Ser. No. 828,426
Int. Cl.[4] B67D *5/62*
U.S. Cl. 62—390 **11 Claims**



1. A cooling apparatus for cooling a beverage to be dispensed from a dispensing apparatus having an inlet for the beverage and outlet means for dispensing the beverage, said cooling apparatus including:

primary instantaneous cooling means locatable between the inlet and the outlet means and having a heat exchanger for cooling the beverage, said primary cooling means comprising at least one cooling assembly having an expansion chamber into which liquid refrigerant may be introduced and at least two flow paths through said chamber, a first said flow path being for the beverage and a second said flow path forming part of a secondary cooling means, said secondary cooling means being in heat exchange relationship with the beverage contained in the outlet means for ensuring that the temperature of the beverage contained in the outlet means is maintained at a desired value prior to dispensing the beverage from the outlet means, said secondary cooling means further including refrigerant circulating means having a supply line coupled to one end of said second flow path, a heat exchanger adapted to be located in heat exchange relationship with the beverage that may be contained in the outlet means and coupled to the other end of said second flow path and a return line between the heat exchanger of the secondary cooling means and the circulating means for returning refrigerant to the circulating means.

4,679,409

ABSORPTION REFRIGERATION CYCLE

Peter W. Fitt, Somerset, England, assignor to I C Gas International Limited, Somerset, England

Filed Sep. 16, 1986, Ser. No. 907,894
Claims priority, application United Kingdom, Sep. 17, 1985, 8522932
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—476 **18 Claims**

1. A system for using an absorption refrigeration cycle and comprising:

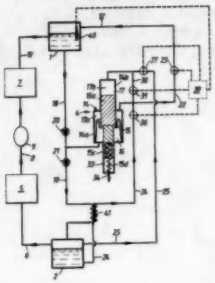
absorber means;

generator means having a liquid space and a vapour space;

condenser means;

evaporator means; and

a pump assembly for pumping liquid from the absorber means to the generator means, said pump assembly comprising a cylinder, piston means separating said cylinder into a first chamber connected by first valve means to said absorber means and said generator means for pumping liquid from said absorber means to said generator means and a second chamber connected by second valve means to said generator means and said absorber means for receiving fluid from said generator means and passing it to said absorber means, wherein said second chamber of said pump assembly comprises first and second parts, said first part of said second chamber being connected by said second valve means to said liquid space of said generator



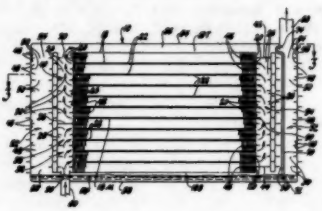
means and said second part of said second chamber being connectable by said second valve means to said vapour space and to said liquid space of said generator means, means being provided for detecting the level of liquid in one of said generator means and said absorber means and for controlling said second valve means to permit either liquid or vapour to flow into said second part of said second chamber in dependence on the level of liquid in said generator means or said absorber means respectively.

4,679,410

INTEGRAL EVAPORATOR AND ACCUMULATOR FOR AIR CONDITIONING SYSTEM

William Drayer, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1986, Ser. No. 924,798
Int. Cl.[4] F25B *43/00, 39/02*
U.S. Cl. 62—503 **2 Claims**



2. An integral accumulator and evaporator for an air conditioning system comprising a plurality of plates stacked one on another with one plate on top and another plate on the bottom of the stack, said plates having an elongated shape with longitudinally spaced evaporator manifold defining cavities interconnected by an elongated evaporator tube pass defining cavity formed in one face thereof, said plates arranged so that their said cavities cooperate with the corresponding ones in an adjoining and oppositely facing plate so as to define a pair of longitudinally spaced evaporator manifold chambers interconnected by a tube pass between each such pair of oppositely facing plates whereby there is formed a plurality of adjoining evaporator chambers adjacent remote ends of the stacked

plates, those plates except for said top and bottom plates and at least one intermediately located plate having an opening connecting the adjoining evaporator chambers at each end so as to define a vertically oriented evaporator manifold with an upper end and a lower end adjacent each end of said stacked plates, said one intermediate plate having an opening connecting the chambers between the two adjoining pairs of said plates adjacent only one of said ends and blocking connection between the corresponding chambers adjacent the other end whereby the manifold adjacent said one end is partitioned into a lower manifold section and an upper manifold section so as to form a flow path from said lower manifold section through the associated tube passes to the other manifold and back through the remaining associated tube passes to said upper manifold section, said top plate having an opening therethrough to said upper manifold section and closing the upper end of the other evaporator manifold, said bottom plate having an opening therethrough to said lower manifold section and closing the other end of said other evaporator manifold, said plates also having accumulator defining cavities in their said face located outboard of said evaporator manifold defining cavities that cooperate with the corresponding ones in the adjoining and oppositely facing plate so as to define a plurality of adjoining accumulator chambers at the remote ends of the stacked plates, said plates having an opening therethrough connecting the adjoining accumulator chambers whereby there is formed a vertically oriented side accumulator chamber with an open top and an open bottom at each said remote end of said stacked plates, a bottom tank sealingly connected to the periphery of said bottom plate so as to cooperate therewith to form a bottom accumulator chamber open to both said side accumulator chambers at their bottom end, an inlet pipe extending through said bottom tank to the opening to said lower manifold section, a top tank sealingly connected to the periphery of said top plate so as to cooperate therewith to form a top accumulator chamber open to the opening to said upper manifold section and also to both said side accumulator chambers at their top, an outlet pipe in said top tank open to the interior thereof and aligned with the top of the side accumulator chamber adjacent said other manifold, and an aspirator tube extending through the last mentioned side accumulator chamber having an inlet end located near the bottom of said bottom tank and an outlet end located in said outlet tube.

4,679,411

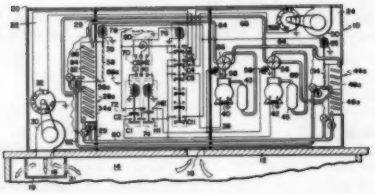
STEPPED CAPACITY CONSTANT VOLUME BUILDING AIR CONDITIONING SYSTEM

Richard H. Pearse, Jr., La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 934,156, Aug. 16, 1978, Pat. No. 4,259,847, which is a continuation-in-part of Ser. No. 789,480, Apr. 21, 1977, abandoned. This application Apr. 6, 1981, Ser. No. 251,620

Int. Cl.[4] F25B *39/02*

U.S. Cl. 62—519 **7 Claims**



1. A vapor compression refrigeration system comprising: evaporator means for evaporating refrigerant; compressor means for compressing vaporous refrigerant; low pressure refrigerant line means for passing refrigerant from the evaporator means to the compressor means; a condenser including a plurality of generally parallel heat exchange fins and a plurality of refrigeration circuits running through the condenser generally transverse to the heat exchange fins, wherein groups of the refrigerant circuits cover in overlapping fashion the area of the condenser transverse to the direction of the flow of an external heat exchange medium moving thereover; condenser-evaporator refrigerant line means for conveying condensed refrigerant from the condenser to the evaporator means; expansion means located in the condenser-evaporator line means for reducing the temperature and pressure of refrigerant passing therethrough; a plurality of high pressure refrigerant lines for passing refrigerant from the compressor means to the condenser; refrigerant distribution means in each of the high pressure refrigerant lines, wherein each group of refrigerant circuits is connected to a different distribution means; means for selectively preventing the flow of refrigerant through at least a selected one of the high pressure refrigerant lines, wherein the group of circuits connected to the distribution means in the selected refrigerant line is removable from service without appreciably reducing the effective heat exchange area of the condenser; said plurality of the refrigerant circuits being intertwined; said compressor means including a plurality of vapor compressors; and said preventing means including switch means to shut down at least one and less than all of said compressors thereby leaving another of said compressors in operation.

4,679,412

METHOD FOR DETERMINING AND CORRECTING THE LENGTH OF A PIECE OF KNITTING PRODUCED ON A FLAT KNITTING MACHINE

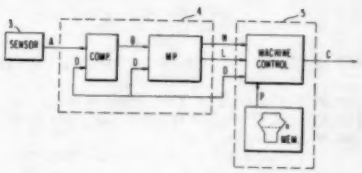
Hans Schieber, and Otto Geitner, both of Bopfingen, Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 568,469, Jan. 5, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,897

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1983, 3300240

Int. Cl.[4] D04B *7/00, 15/80*

U.S. Cl. 66—71 **4 Claims**



1. A method of determining and correcting the length of a piece of knitting being produced on an electronically controlled flat knitting machine, comprising the steps of:

(a) continuously determining the real length of the piece of knitting being produced by means of a sensor between a needle bed and a knitted piece withdrawal means;

(b) comparing in a comperator of a digital control circuit the determined real length value with an instantaneous desired length value stored in a programmed memory of a machine control system;

(c) processing resulting comparison value and said desired length value in a microprocessor of said digital control circuit;

(d) feeding an overruling stitch length signal and an overruling course number signal from said microprocessor to a machine control circuit in said machine control system;

whereby the stitch length and the number of subsequent courses as well as the shape and the type of knitting and pattern of the remainder of the piece being knitted are controlled by said resulting comparison value and said desired length value.

4,679,413
FLAT-BED KNITTING MACHINE HAVING A SPOOL TABLE PROVIDED WITH MOVABLE YARN SPOOL HOLDERS

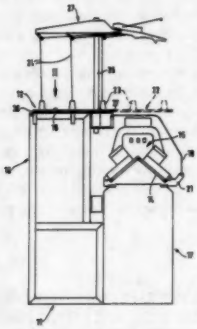
Adam Müller, and Ernst Goller, both of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,266

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528693

Int. Cl.[4] D04B *3/06*

U.S. Cl. 66—125 R **16 Claims**



1. A flat-bed knitting machine, comprising:
a needle bed apparatus;
a carriage apparatus;
a spool table disposed in the rear area of the machine above the needle bed apparatus and the carriage apparatus;
at least one pull-out apparatus mounted to the spool table, each pull-out apparatus including a guide rail, a pull-out rail movable relative to the guide rail and at least one yarn spool holder mounted to the pull-out rail; and
a yarn supply device for each yarn spool holder.

4,679,414
APPARATUS FOR CONTROLLING A DEWATERING PROCESS

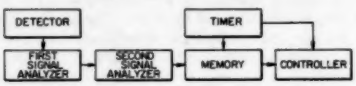
Kazutoshi Takimoto, Yao; Takatomo Matsumi, Fujiidera, and Koji Kikuchi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 23, 1985, Ser. No. 790,347

Claims priority, application Japan, Jan. 18, 1985, 60-7861; Feb. 6, 1985, 60-22199

Int. Cl.[4] D06F *33/02*

U.S. Cl. 68—12 R **1 Claim**



1. An apparatus for dewatering control comprising
a detector serving to output a signal corresponding to the rate of water ejected from a dewatering tank,
a first signal-analyzing means for determining whether an output signal from said detector is of a specified kind or not,
a second signal-analyzing means for repeatedly determining, when said output signal is determined to be of said specific kind by said first signal-analyzing means, whether a signal of said specified kind has continued for a fixed time duration or not,
a timer serving to count time from the beginning of a dewatering operation,
a memory means serving to read and store a time datum from said timer when said second signal-analyzing means determines that signal of said specified kind has continued for said fixed time duration and to update said time datum every time it is determined that a signal of said specified type has continued for said specified time duration, and
a controlling means for controlling the termination of dewatering operation on the basis of time datum stored in said memory means a specified time interval after the beginning of said dewatering operation.

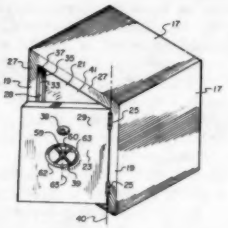
4,679,415
LOCKING MECHANISM FOR LIGHTWEIGHT SECURITY CABINET

Kenneth Spratt, Provo, Utah, assignor to Thomas A. James, Mapleton, Utah

Filed Dec. 10, 1985, Ser. No. 806,826

Int. Cl.[4] E05B *63/14*

U.S. Cl. 70—118 **3 Claims**



1. A lightweight security cabinet presenting a box-like structure having a full back panel in association with vertical side panels and top and bottom panels positioned perpendicular to said back panel and joined thereto to form an open box-like structure, said security cabinet having a door, having edges, pivotedly mounted within an outlining frame assembly by means of at least one hinge, said door and attendant frame assembly being mounted on said open box-like structure to form a sealable enclosure, said cabinet having a locking mechanism for use on an interior surface of a security cabinet door, said mechanism comprising:
a driven gear mounted rotatably on said interior surface of said cabinet door, said driven gear being driven by an actuation means made manipulatable from the exterior surface of said door;
a rack-type gear mounted slidably along the interior surface of said door, said rack-type gear being mechanically cooperable with said driven gear whereby a rotation of said driven gear displaces said rack-type gear along the interior surface of said door;
a first shaft fixedly mounted on said rack-type gear, said first shaft being slidably supported on said interior door surface by a plurality of first support means whereby a displacement of said rack-type gear effects a linear displacement of said first shaft;
a pair of restraining members spacedly positioned apart on said first shaft and defining a channel therebetween;
a second shaft pivotedly mounted on the interior surface of said cabinet door by a first pivot mounting upstanding from said cabinet door, a portion of said second shaft being positioned within said channel defined by said restraining members whereby a displacement of said first shaft effects a pivoting action of said second shaft about its pivot point;
a third shaft positioned slidably on said interior door surface by a plurality of third support means, said third shaft being pivotedly mounted to a distal end of said second shaft

whereby a rotation of said second shaft about its pivot point effects a substantially linear displacement of said third shaft along said interior door surface; and

first retaining means mounted on said third shaft and made slidable along the interior door surface of said cabinet, said first retaining means being slidable between two conditions, said conditions being a first condition wherein a portion of said first retaining means does not extend beyond an edge of said door surface and a second condition wherein a portion of said first retaining means is extended beyond the surface of said door whereby the extension of said first retaining means beyond said door edge when the door is in a closed position results in an abutment of said first retaining means against said frame assembly of said security cabinet resulting in said door being made substantially unmovable absent a retraction of said first retaining means;

a fourth shaft, mounted slidably on said interior door surface of said cabinet;

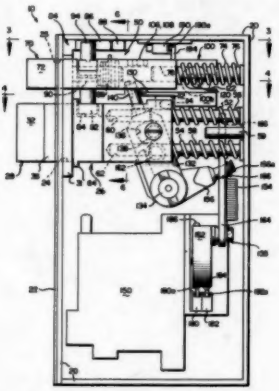
a fifth elongate shaft having a distal end and a proximal end; said fifth shaft member being floatingly mounted to said cabinet solely by mounting said distal end pivotedly on said second shaft member; wherein said entire fifth shaft is free to be displaced about said door surface by the motion of said second and fourth shaft members.

4,679,416

TRIGGER AND LATCH BOLT ASSEMBLY

Raymond V. Kambic, Joliet, Ill., assignor to R. R. Brink Locking Systems, Inc., Plainfield, Ill.

Filed Aug. 6, 1984, Ser. No. 637,914
Int. Cl.[4] E05B *55/00*
U.S. Cl. 70—143 **23 Claims**



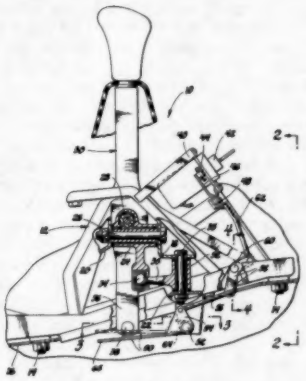
1. A lock mechanism including; a casing structure adapted to be mounted to one of a door and a door frame for cooperation with an apertured strike plate mounted to the other of said door and door frame, said lock mechanism further comprising; a pair of apertures formed in said casing structure; a latch bolt retractably mounted with respect to said casing structure and biased to an extended, first position wherein a latching portion thereof extends from one of said casing apertures for engagement with said strike plate aperture, and said latch bolt being movable to a second retracted position; said latching portion of said latch bolt including a beveled leading surface located proximate the distal end of said latch bolt for engagement with said strike plate to move said latch bolt to the retracted position, and an unbeveled portion adjacent said beveled portion; a biased trigger bolt mounted to said casing structure and extending from a second one of said apertures, said trigger bolt including a camming surface and being positioned to have its camming surface engage the strike plate prior to said latch bolt, which engagement will retract said trigger bolt a predetermined amount prior to engagement of the latch bolt with said strike plate; and means operatively coupling said trigger bolt and said latch bolt such that initial retraction of the trigger bolt will effect partial and preliminary retraction of the latch bolt, which preliminary retraction of the latch bolt positions said beveled surface thereon to engage the strike plate.

4,679,417

TRANSMISSION SELECTOR ASSEMBLY AND LATCHING MECHANISM

Kenneth L. Van Cise, Jr., Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1986, Ser. No. 866,699
Int. Cl.[4] B60R *25/06*
U.S. Cl. 70—247 **2 Claims**

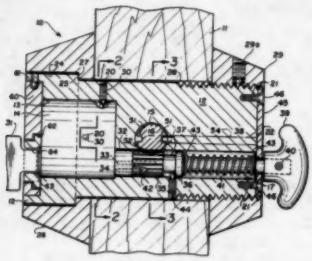


2. A console mounted transmission selector mechanism including a latching mechanism comprising; a housing secured to a vehicle body member; a shift lever pivotally mounted in said housing and being pivotally manipulated to a plurality of transmission selector positions including a vehicle parking position; a vehicle key operated mechanism secured in said housing and being manipulable to LOCK, RUN and OFF positions; a latching plate pivotally mounted in said housing and including a latch opening; and linkage means disposed between said key operated mechanism and said latching plate for pivoting said latching plate when said key operated mechanism is manipulated to the LOCK position, including a first bellcrank operatively connected to said vehicle key operated mechanism, a crank arm secured to said latching plate, a second bellcrank pivotally disposed on said housing, a first link connected between said first and second bellcranks and a second link connected between said second bellcrank and said crank arm, said shift lever having an extension alignable with said latch opening when said shift lever is manipulated to said vehicle parking position, said extension preventing pivoting of said latching plate by said key operated mechanism prior to said shift lever being positioned in said vehicle parking position and said latching plate preventing manipulation of said shift lever from said vehicle parking position if said key operated mechanism is in said LOCK position.

4,679,418
HIGH SECURITY CYLINDER LOCK

Mark L. Allen, 1776 E. 13th St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 685,222, Dec. 26, 1984, Pat. No. 4,593,546. This application Apr. 2, 1986, Ser. No. 847,183
Int. Cl.[4] E05B *9/10*
U.S. Cl. 70—380 4 Claims

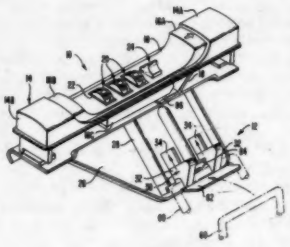


1. A high security door lock comprising: a lock housing comprising a solid cylindrical member having an outwardly projecting rim at one end thereof, said rim providing an external shoulder spaced from said one end, the other end of said cylindrical member being threaded so that a flange means can be threaded onto said cylindrical member, said cylindrical member being provided at said one end with an axial bore having a depth greater than the longitudinal length of a lock cylinder, a second longitudinal bore extending from the bottom of said axial bore to said other end of said cylindrical member, a bolt receiving bore intersecting at least a portion of said second bore and extending transversely through said cylindrical member so that a bolt can be inserted therein from either side of said cylindrical member; lock cylinder means including a key operated plug positioned at the bottom of said first bore so as to leave a space in said bore at said one end of said housing in front of said lock cylinder, said lock cylinder means being provided with a bolt moving member extending into said second bore; bolt driving means mounted in said second bore in position to be actuated by said bolt moving member of said lock cylinder to drive a bolt into and out of a locking position; a solid bolt slidably positioned in said bolt receiving bore so that a portion thereof engages said bolt driving means, said bolt when driven to a locking position remaining in engagement with said bolt driving means and in said bolt receiving bore so as to prevent said cylindrical member being rotated in a door in which it is installed; an annular collar member having an internal shoulder and adapted to slide over said cylindrical member so that when the shoulder of said collar member abuts the shoulder of said cylindrical member the end of said collar member is flush with said one end of said cylindrical member and can rotate freely theron; flange means threaded onto the threaded end of said cylindrical member to engage the inner side of a door in which the lock is installed; second bolt moving means mounted in said second bore and extending to said other end of said cylindrical member, said second bolt moving means being adapted to disengage said bolt driving means from said bolt moving member of said lock cylinder and to actuate said bolt driving means when the latter is so disengaged; a guard plate positioned in and substantially filling the space in said bore in front of said lock cylinder, said guard plate having an aperture aligned with said cylinder plug whereby a key may be inserted through said aperture and into said plug so as to actuate said bolt moving member; and means extending from the sidewall of said housing into the peripheral edge of said guard plate to secure said guard plate in said housing.

4,679,419
FRONT-PROGRAMMABLE COMBINATION LOCK WITH MOVABLE FACEPLATE

Stephen S. Scelba, Clifton, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Apr. 25, 1986, Ser. No. 855,639
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—312 15 Claims

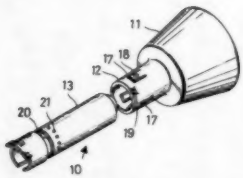


1. A combination lock comprising a casing including a fixed portion and a movable faceplate, a plurality of combination members supported for movement with the faceplate, and also for combination setting movement relative to the faceplate, means for preventing movement of the faceplate in a predetermined direction until the combination members have been set to an opening combination of the lock and for thereupon permitting such movement, and manually shiftable means movable with the faceplate, and also shiftable relative to the faceplate for enabling the combination members to select another opening combination of the lock.

4,679,420
FORCE IMMUNE DOOR LATCH

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jan. 2, 1985, Ser. No. 688,338
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—422 4 Claims



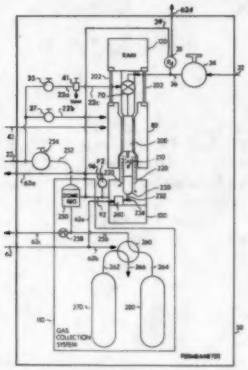
1. A force immune door latch, in combination, comprising: a handle, a sleeve extending rearwardly of the handle, said sleeve having a forward reduced end and a rearward enlarged end, said ends defining a shoulder therebetween, an inner annular collar having at least one aperture formed therein, said collar being positioned abutting the shoulder, nested within the rearward enlarged end of the sleeve on a substantially common longitudinal axis therewith, a cylinder having a locked position and an unlocked position and further having a plurality of depressions formed annularly therein, said cylinder being nested with respect to the sleeve, the collar and the handle such that the handle, sleeve, and the collar having a substantially common longitudinal axis, means cooperating between the collar and the rearward enlarged end to preclude substantial axial separation and rotational movement therebetween, means cooperating between the cylinder and the forward reduced end of the sleeve to preclude substantial axial separation therebetween, a spring-loaded ball detent being positioned within the aperture of the collar with its biasing force being

oriented inwardly in a direction substantially perpendicular to the common longitudinal axis, wherein said detent is received within the depressions on the cylinder to accommodate rotation of the cylinder and the handle substantially in unison with each other in the unlocked position of the cylinder, but providing relative rotation therebetween in the locked position of the cylinder, whereby in the locked position of the cylinder excessive torque applied to the handle normally sufficient to break the latch will not result in breakage thereof, thereby precluding an undesired destruction of the lock by a burglar or others.

4,679,421
AUTOMATED GAS-LIQUID RELATIVE PERMEAMETER

Robert D. Barree, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 10, 1986, Ser. No. 884,252
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **34 Claims**



1. An automated gas-liquid relative permeameter for determining the relative permeability of a core sample, said permeameter comprising:

means (**40**) for providing a vacuum,

means (**30**) for providing a supply of helium gas,

means (**20**) for providing a supply of nitrogen gas,

means (**80**) connected to said vacuum and nitrogen providing means for holding said core at a predetermined pressure,

means (**120**) engaging the top of said core and connected to said holding means for applying said predetermined pressure to said top of said core,

means (**70**) cooperative with said applying means and connected to said helium providing means and said nitrogen providing means for supplying said helium gas to said top of said core under control of said nitrogen gas,

means (**100**) engaging the bottom of said core and removably connected to said holding means for delivering said predetermined pressure to said bottom of said core,

means (**90**) cooperative with said delivering means for collecting produced liquid from said core sample when said helium gas is supplied to said top of said core by said supply means,

means (**240**) engaging said produced liquid collecting means for instantaneously weighing said collected fluid,

means (**110**) cooperative with said delivering means for collecting produced helium gas from said core sample when said helium gas is supplied to said top of said core by said supplying means,

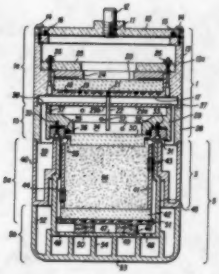
means (**258**) connected to said produced helium collecting means for instantaneously measuring the pressure of said collected helium gas, and

means (**60**) connected to said weighing means and to said measuring means for automatically determining said gas-liquid relative permeability of said core sample.

4,679,422
METHOD AND APPARATUS FOR STEADY-STATE MEASUREMENT OF LIQUID CONDUCTIVITY IN POROUS MEDIA

Jacob Rubin, Palo Alto, Calif.; Dale P. Hammermeister, Las Vegas, Nev., and John R. Nimmo, Mountain View, Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 28, 1986, Ser. No. 901,360
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **13 Claims**



1. A method for establishing and measuring the steady-state flow of a liquid through a unsaturated porous medium and determining the medium's liquid conductivity comprising the steps of:

(a) placing a compacted sample of the porous medium on which the measurements are to be made on a liquid conducting surface;

(b) providing for the passing of a continuous supply of a liquid with constant pressures maintained at the liquid inflow and outflow sides of said sample;

(c) subjecting said sample to a constant centrifugal force;

(d) collecting the liquid passing through said sample;

(e) measuring the flow rate of said liquid through said medium and the liquid content of said medium until these measurements are substantially constant over a predetermined time interval; and

(f) computing the liquid conductivity of said medium from the measurement of said flow rate and the distribution of liquid within said medium.

4,679,423
METHOD AND APPARATUS FOR MEASURING THE PORE SIZE OF ENHANCED TUBES

Paul H. Ballentine, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

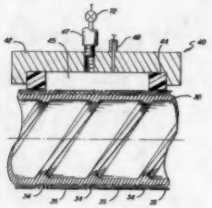
Filed Dec. 16, 1985, Ser. No. 809,619
Int. Cl.[4] G01B *13/08*
U.S. Cl. 73—37.5 **3 Claims**

1. A pore measuring system for accurately measuring during production the average pore size on the surface of an enhanced evaporator tube having subsurface channels connected by pores on the surface, the average pore size measuring system comprising:

a fluid pressure source;

two separate fluid pressure flow path means in fluid flow communication with said fluid pressure source, a first fluid pressure flow path including at least two parallel fluid pressure flow circuit means, a first fluid pressure flow circuit means having an adjustable flow control valve and

a movable test housing downstream of said adjustable flow control valve for matingly engaging a portion of the surface of the enhanced evaporator tube, said movable test housing defining a passage for the flow of said fluid pressure source through the pores on the enhanced evaporator tube to the surroundings to reduce the fluid pressure downstream of said first fluid pressure flow path adjustable flow control valve, and a second fluid pressure flow circuit means having a second adjustable flow control valve and a reference orifice downstream of said second adjustable flow control valve, said reference orifice having a predetermined area, a second fluid pressure flow path means including a clamp means for moving said movable test housing by fluid pressure from said fluid



pressure source into mating engagement with a portion of the surface of the enhanced evaporator tube; and

a differential pressure transducer means for measuring the difference in pressure between said at least two parallel fluid pressure flow circuit means whereby one side of said differential pressure transducer means is connected in fluid communication downstream of said adjustable flow control valve and another side of said differential pressure transducer means is connected in fluid communication downstream of said second adjustable flow control valve thereby measuring the difference in pressure drop across the subsurface channels between pores on the enhanced evaporator tube and the pressure across said reference orifice.

4,679,424

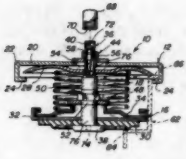
PRESSURE TESTER CAP

Iosif Tubman, 1480 E. 17th St., Brooklyn, N.Y. 11230

Filed Sep. 8, 1986, Ser. No. 906,280

Int. Cl.[4] G01M *3/32*

U.S. Cl. 73—45.8 **4 Claims**



1. A pressure tester cap as of the type having a cover assembly removably mounted on a neck of a radiator of a motor vehicle, a valve assembly of a smaller diameter of said cover assembly and said valve assembly urging said valve assembly away from said cover assembly, the improvement comprising:

(a) an air valve sleeve having one end supporting said valve assembly and having its other end extending through said cover assembly;

(b) means for holding said valve assembly on said air valve sleeve, wherein said holding means comprises:

(i) a lower washer to fit over said air valve stem and onto top of said valve assembly; and

(ii) a nut which threadably engages lower portion of said air valve sleeve to make contact of with said lower washer for holding said valve assembly in place; and

(c) means for securing said air valve sleeve on said cover assembly so that air under pressure can be discharged into said radiator from an air hose chuck to check said radiator for leaks and still permit fluid to escape from said radiator when pressure in said radiator rises above a predetermined level.

4,679,425

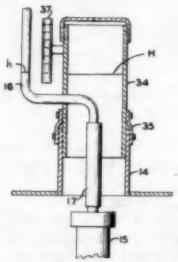
LIQUID STORAGE TANK LEAK DETECTION SYSTEM

Daniel B. Bolland, Convent Station, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 5, 1985, Ser. No. 804,861

Int. Cl.[4] G01F *23/02*

U.S. Cl. 73—49.2 **12 Claims**



1. An apparatus for determining whether fluid is leaking from a fluid storage tank having a fill pipe, said apparatus comprising:

a first vertical tube adapted to be inserted into the tank being tested via the fill pipe and having a length substantially equal to the diameter of said tank, said tube being sealed at the bottom;

a second tube adapted to be vertically positioned under conditons of use of said apparatus, said second tube having a predetermined diameter;

means for connecting said second tube to the top of said first tube whereby said first and second tube define a fluid container;

means for filling said first and second tube with fluid to a predetermined level in said second tube;

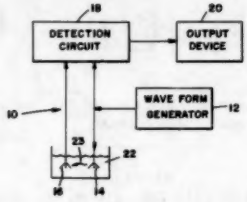
said second tube having a diameter relative to the diameter of the fill pipe such that any change in the level of fluid in said second tube and said fill pipe resulting from a change in temperature of the fluids therein are proportional; and

means for determining any deviation from a proportional change in the fluid level in the second tube and fill pipe whereby any such deviation is indicative of a leak of fluid from said tank.

4,679,426
WAVE SHAPE CHEMICAL ANALYSIS APPARATUS AND METHOD

Milton E. Fuller, 301 Bartlett St., Reno, Nev. 89512, and Gary S. Fletcher, Jr., 8123 Sunrise Blvd., No. 224, Citrus Heights, Calif. 95610

Filed Sep. 9, 1985, Ser. No. 774,150
Int. Cl.[4] G01N *29/02*
U.S. Cl. 73—53 **21 Claims**



1. An apparatus for measuring the concentration of a chemical in a test sample, said apparatus comprising:

electromagnetic waveform generation means for generating an electromagnetic signal having a periodic waveform of known shape;

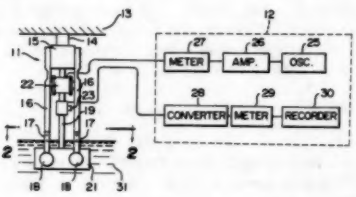
antenna means coupled to said waveform generation means for transmitting said electromagnetic signal into the test sample and for receiving a corresponding periodic electromagnetic signal having a waveform with a shape changed from said known shape as a result of propagation of said electromagnetic signal through the test sample; and

detection means coupled to said antenna means and responsive to the transmitted and received electromagnetic signals for quantifying the change in shape of said received electromagnetic signal with respect to said known shape of said transmitted electromagnetic signal, said detection means further being formed to determine the concentration of the chemical in the test sample by correlation of the magnitude of the change in shape relative to a known concentration of the chemical from calibration test samples.

4,679,427
APPARATUS FOR MEASURING VISCOSITY

Mamoru Kanda, Tokyo; Osamu Suzuki, Kumagaya; Shousuke Ishiwata, Saitama, and Mitsuroh Hayashi, Kumagaya, all of Japan, assignors to Chichibu Cement Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 559,948, Dec. 9, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,755
Claims priority, application Japan, Dec. 13, 1982, 57-218054
Int. Cl.[4] G01N *11/16*
U.S. Cl. 73—54 **12 Claims**

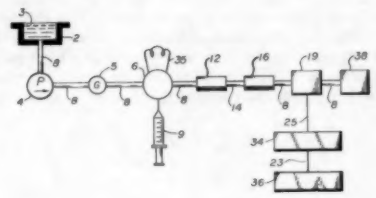


1. An apparatus for measuring the viscosity of a viscous substance, comprising: two thin spaced-apart plates of similar size and shape and having opposed major, parallel surfaces, the two plates being immersible during use of the apparatus in a viscous substance whose viscosity is to be measured; driving means for vibrationally driving the two plates while immersed in the viscous substance such that the two plates undergo vibration in a plane parallel to the major surfaces of the two plates and at the same vibrational frequency but in opposite phase relation whereby the amplitude of vibration of the two plates is proportional to the viscosity of the viscous substance; detecting means for detecting the amplitude of vibration of at least one of the two plates and producing a corresponding electrical output signal representative of the viscosity of the viscous substance; and two similar static plates stationarily disposed relative to and on opposite sides of the two plates, each static plate having a surface extending parallel to and spaced from confronting major surfaces of the two plates.

4,679,428
INDEPENDENT ANALYSIS OF ANIONS AND CATIONS USING INDIRECT PHOTOMETRIC CHROMATOGRAPHY

Theodore E. Miller, Jr., and Ziad Iskandarani, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 682,032, Dec. 12, 1984, Pat. No. 4,567,753. This application Jan. 24, 1986, Ser. No. 822,188
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] G01N *31/04*
U.S. Cl. 73—61.1 C **6 Claims**



1. An ion chromatography method for simultaneous and fully independent analysis of sample cations and anions, the method comprising:

(a) eluting a sample containing transparent cations and anions through an ion exchange chromatography column means comprising a cation ion exchange-performing stationary phase and an anion ion exchange-performing phase,

(b) using as the eluent an electrolyte solution of effective displacing ions consisting essentially of a single salt of a photometrically detectable cation and anion having constant absorptivity ratios, relative to two wavelengths, distinctive of the cation and anion,

(c) monitoring the absorbance of the effluent of the chromatography column means at different wavelengths at which the cation and anion have said constant absorptivity ratios distinctive of each, and

(d) quantitatively analyzing the sample independently for sample cations and sample anions.

4,679,429

HYDRAULIC RAM STROKE MONITORING APPARATUS

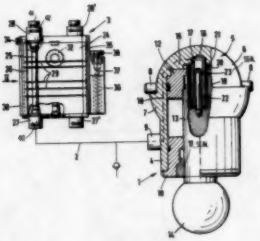
Gerhard Merten; Werner Rafael, both of Lunen, and Horst Schlüsener, Werne, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,404

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502806

Int. Cl.[4] F15B *21/04*; G01M *19/00*

U.S. Cl. 73—168 11 Claims



1. In a hydraulic arrangement comprising a hydraulic ram (1) and apparatus (3) for monitoring the working stroke of the hydraulic ram, such as for adjusting the cutting horizon of a mineral winning machine in the form of a coal plough or the like, the monitoring apparatus including an indicator having a housing (24) containing a tubular measuring chamber (25) connected to the hydraulic ram by a hydraulic line (2), the improvements comprising: the tubular measuring chamber being transparent on at least one side for the observation of the level of hydraulic fluid contained therein, means connecting the lower end of the tubular measuring chamber to the hydraulic line leading to the hydraulic ram, and an air-permeable but dust-impermeable plug (28) closing the upper end of the tubular measuring chamber, said plug thus establishing atmospheric communication with the upper interior of the measuring chamber while shielding the interior of the chamber from contaminating dust particles, and said plug being removable from the chamber to enable the insertion thereinto of a calibrating device.

4,679,430

ULTRASONIC LIQUID INTERFACE DETECTOR

Colin B. Scott-Kestin, Stoke-sub-Hamdon; Roger B. Pike, Newbury; Roger D. Watkins, Wantage; Arthur B. Gillespie, Abingdon, and Michael O. Deighton, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

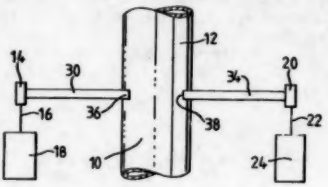
Filed Mar. 26, 1984, Ser. No. 593,277

Claims priority, application United Kingdom, Mar. 30, 1983, 8308813

Int. Cl.[4] G01F *23/22*

U.S. Cl. 73—290 V 8 Claims

1. A method for detecting an interface of a liquid in a container comprising, causing Lamb waves to propagate through a portion of a wall of the container, receiving the Lamb waves after they have propagated through the portion of the wall, and detecting the liquid interface in response to the amplitude of the received Lamb waves, wherein the Lamb waves are transmitted to and from the portion of the wall as Lamb waves propagating along respective strip waveguides, only an end of each waveguide contacting the wall thereby separating transmitting and receiving transducers of the propagated lamb waves from the wall of the container.



4,679,431

PROBE ASSEMBLIES INCLUDING SUCH MOUNTS

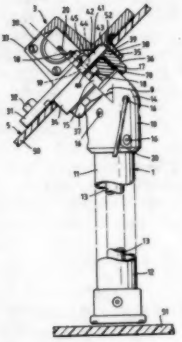
Neil R. Jacob, and John R. Suiter, both of Basingstoke, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Mar. 5, 1986, Ser. No. 836,670

Claims priority, application United Kingdom, Mar. 15, 1985, 8506716

Int. Cl.[4] G01F *23/00, 23/26*

U.S. Cl. 73—290 R 9 Claims



1. A stress-relieving mount for supporting an elongate fluid-gauging probe in a fluid reservoir, said mount comprising: a plurality of discs, each disc having an aperture therethrough in a central region of the disc, and an outer edge; means securing said discs to one another centrally around said apertures; means securing said discs to one another around their respective outer edges; means securing the mount at the joined central regions of said discs solely with one end of said probe; and means securing the joined outer edges of the discs solely with a wall of the reservoir such that vibrational stresses of the probe are accommodated by deflection of the joined central regions of the discs relative to the outer edges of the discs.

4,679,432

PROBE FOR MEASURING THE LEVEL OF A LIQUID

Erich Draeger, Asnieres, France, assignor to Veglia, Paris, France

Filed Nov. 26, 1985, Ser. No. 801,860

Claims priority, application France, Nov. 27, 1984, 84 18025

Int. Cl.[4] G01F *23/24*

U.S. Cl. 73—295 5 Claims

1. A probe for measuring the level of a liquid in a reservoir

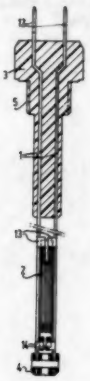
which is at least partially filled with said liquid, said probe comprising:

a first insulating support member;

a conductor of given length made from a material whose resistance depends on its temperature, said conductor being supported on said first insulating support member;

a second insulating support member spaced apart from said first insulating support member;

a pair of elongated metal pieces supported on said second insulating support member, said metal pieces having first ends and second ends, said first ends forming output electrodes of said probe, said second ends being electrically connected to said conductor and supporting said conductor, said first ends being adapted to be connected to a constant current source such that said conductor can be heated by said constant current source;



means for mounting said metal pieces on said reservoir so that said conductor is in said liquid over a first part of its length and in a gaseous medium over a non-immersed second remaining part of its length; and

measuring means connected to said conductor for measuring a voltage drop at said conductor as an indication of said level of said liquid.

4,679,433

FLUID-GAUGING SYSTEMS

Peter Clinton, Crewe, Cheshire; Ronald V. Myers, Basingstoke, Hampshire, and David Sinclair, Camberley, Surrey, all of England, assignors to Smiths Industries Public Limited Company, London, England

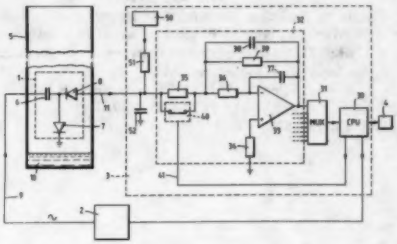
Filed Apr. 3, 1986, Ser. No. 847,461

Claims priority, application United Kingdom, Apr. 3, 1985, 8508741; Aug. 3, 1985, 8519581

Int. Cl.[4] G01F *23/26*

U.S. Cl. 73—304 C **10 Claims**

1. A fluid-gauging system of the kind including a capacitive sensor unit comprising a capacitor and at least one unidirectional current device connected to the output of the capacitor, the capacitor being mounted for immersion within the fluid, a first electrical supply that supplies an alternating electric signal to the sensor unit such that the output of the sensor unit varies in accordance with change in fluid quantity, and a measuring unit connected to receive the output of the sensor unit, the improvement wherein the system includes means for causing the said first electrical supply periodically to interrupt the supply of alternating signal to the unidirectional current device, and a second supply of steady current, that supplies steady current to the unidirectional current device, and wherein the measuring unit derives an indication of voltage



across the unidirectional current device when the supply of alternating signal is interrupted.

4,679,434

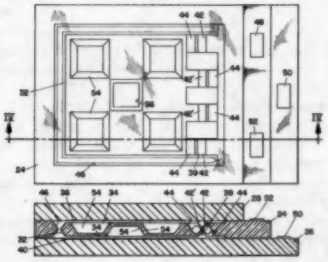
INTEGRATED FORCE BALANCED ACCELEROMETER

Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 25, 1985, Ser. No. 758,692

Int. Cl.[4] G01P *15/02*

U.S. Cl. 73—517 B **13 Claims**



1. An integrated, force balanced accelerometer, comprising:

capacitance forming means having substantially parallel electrodes;

acceleration sensitive means flexibly mounted between said parallel electrodes in a neutral position;

said acceleration sensitive means formed within a substrate of semiconductor material by forming an opening therein that defines the periphery of said acceleration sensitive means in said substrate to define an inertial mass attached to said substrate by hinge means;

said hinge means, include crossed beam flexure blades formed within said semiconductor substrate;

means for applying a D.C. electrical potential across said parallel electrodes of said capacitance forming means to establish a bias field;

a means for generating A.C. electrical potentials between said acceleration sensitive means and said parallel electrodes, which potential change as said acceleration sensitive means undergoes a displacement from said neutral position; and

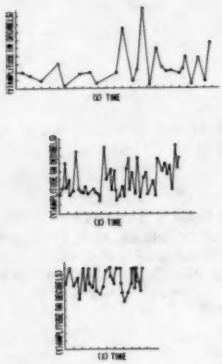
electronic means connected between said parallel electrodes of said capacitance forming means and said acceleration sensitive means to close an electrical servo loop therebetween, wherein motion of said acceleration sensitive means causes an output from said electronic means to return said acceleration sensitive means to said neutral position and represent the acceleration of said accelerometer.

4,679,435

GAS CONTENT DETERMINATION OF EVAPORITE FORMATIONS USING ACOUSTIC EMISSIONS DURING DISSOLUTION

Gerald L. Finfinger, West Mifflin; Roger L. King, and Thomas E. Marshall, both of Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 11, 1986, Ser. No. 838,490
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—594 **5 Claims**



5. A method for determining the presence and magnitude of the gas content of an evaporite formation comprising the steps of:

(a) obtaining a small sample from the formation to be mined;

(b) placing said sample into a container of water, which container with sample and water is then placed into a sound-proof chamber;

(c) sensing the acoustic emissions from said sample as it dissolves in the water;

(d) recording the level of acoustic emissions produced as the sample dissolves during a time period of predetermined duration; and

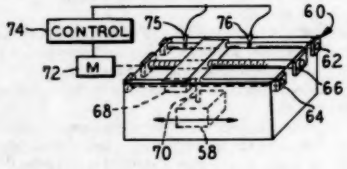
(e) predicting the volume of gas contained in the evaporite formation to be mined.

4,679,436

RECIPROCATING METHOD AND APPARATUS FOR PRODUCING UNIFORM ULTRASONIC FIELD FOR USE IN LIQUID CRYSTAL BASED ACOUSTICAL IMAGING

Jaswinder S. Sandhu, Buffalo Grove, Ill., assignor to Raj Technology, Inc., Morton Grove, Ill.

Filed Aug. 5, 1986, Ser. No. 893,253
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—603 **25 Claims**



1. An apparatus for producing a substantially uniform acoustic field for use in producing an image on a liquid crystal display cell, where the display cell includes a layer of liquid crystal material disposed and encapsulated between a pair of cover members, said apparatus comprising:

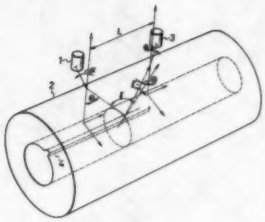
transducer means for producing acoustic energy and for radiating the acoustic energy therefrom in a direction toward an object, and means for moving said transducer means toward and away from said object at a rate so as to produce said substantially uniform acoustic field.

4,679,437

METHOD OF DETECTING FLAWS IN THICK WALL STEEL PIPE WITH ULTRASONIC ANGLE BEAM TECHNIQUE

Mitsuhiro Koike, and Nobuaki Yakoh, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 4, 1985, Ser. No. 784,081
Claims priority, application Japan, Oct. 4, 1984, 59-208806
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 **6 Claims**



1. In a method of detecting longitudinal flaws in a thick wall steel pipe with an ultrasonic beam in which the flaw on an inner surface of a thick wall steel pipe being tested is detected by a shear wave of the ultrasonic beam using a transmitting probe (**1**) and a receiving probe (**3**), the improvement wherein said transmitting probe is disposed slantingly relative to longitudinal and transverse directions of said pipe so that the shear wave of an ultrasonic beam transmitted therefrom is incident onto said pipe at an oblique refraction angle and said transmitted wave impinges onto a longitudinal flaw on said inner surface of said pipe at an oblique incidence angle, and said receiving probe is disposed geometrically so as to receive ultrasonic waves reflected from said flaw of said inner surface; and wherein a transverse incidence angle γ of said ultrasonic beam is determined in accordance with:

$$\tan \gamma = \sqrt{\tan^2 \theta_L + \frac{(\sin^2 \theta_t)/(1 - 2t/D)^2}{1 - (\sin^2 \theta_t)/(1 - 2t/D)^2}} \ ,$$

where θ_L is an angular component of said refraction angle, θ_t is a transverse component of said refraction angle in said pipe, t is a wall thickness of said pipe, and D is an outer diameter of said pipe.

4,679,438

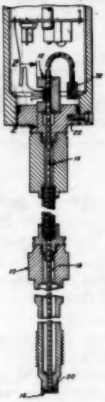
HIGH PRESSURE TRANSDUCER

William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 689,385, Jan. 7, 1985. This application Nov. 14, 1985, Ser. No. 798,169
Int. Cl.[4] G01L *7/08, 9/04*
U.S. Cl. 73—726 **12 Claims**

1. In a liquid-filled pressure transducer having a frame, a capillary tube extending through the frame and a sensing element having a bore for receiving the capillary tube, a method of securing the sensing element to the capillary tube in a liquid-

tight manner, said method comprising the steps of, providing a weld prep indentation in the sensing element adjacent and about the sensing element bore, inserting the capillary tube in the sensing element, swaging the weld prep indentation so as to



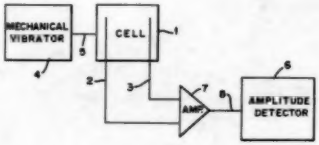
grip the capillary tube with at least a small gripping force, and welding the area about the capillary tube where the weld prep indentation is disposed to form a liquid-tight weld between the capillary tube and sensing element.

4,679,439

METHOD AND APPARATUS FOR MEASURING THE UNSTEADY SEDIMENTATION POTENTIAL OF COLLOIDAL PARTICLES

Joseph B. Culkin, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Sep. 17, 1985, Ser. No. 777,101
Int. Cl.[4] G01N *27/00*
U.S. Cl. 73—61.4 25 Claims



1. A method for measuring the unsteady sedimentation potential of particles in suspension comprising:

inserting at least a portion of said suspension of particles in a cell, said cell having a first electrode and a second electrode;

vibrating the entire cells at a frequency in the range between 0.001–50 khz to accelerate said particles in suspension contained therein to cause an unsteady sedimentation of said particles in suspension; and

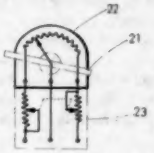
measuring the unsteady sedimentation potential of the accelerated particles across said first and second electrodes.

4,679,440

THROTTLE SENSOR FOR ENGINE

Masayuki Okamura, Aichi, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Ichi, Japan

Filed Dec. 18, 1984, Ser. No. 683,188
Claims priority, application Japan, Jan. 20, 1984, 59-9202
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 1 Claim



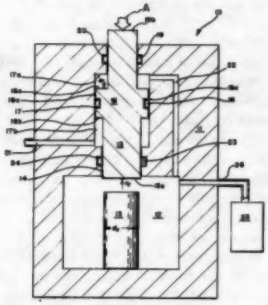
1. A throttle sensor for an engine comprising a first variable resistor having an operating element fixed with a movable portion of a throttle valve of the engine and adapted to output an electrical signal having a magnitude corresponding to the degree of opening of the throttle valve, and means to automatically adjust the correlative value of said electrical signal to the opening degree of the throttle valve, said means comprising a composite circuit variable resistor means connected electrically to said first variable resistor and adapted to correct a correlative value between the opening degree of the throttle valve and the magnitude of the electrical signal output from said first variable resistance, said composite circuit variable resistor means including a second and third variable resistor, said second and third resistors each having slide adjustment means interlocked with each other, an output terminal on said first variable resistor, and said slide adjustment means being separately adjustable with respect to each other, so as to set an output voltage from said output terminal to a target value of an output voltage corresponding to the opening degree of said throttle valve.

4,679,441

PRESSURE BALANCED LOADING PISTON FOR TRIAXIAL TEST CELLS

Christopher F. Johnson, Bountiful, and Sidney J. Green, Salt Lake City, both of Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed Mar. 27, 1986, Ser. No. 845,249
Int. Cl.[4] G01N *3/10*
U.S. Cl. 73—798 9 Claims



1. A triaxial test cell and piston therefor comprising a triaxial test cell housing containing a vessel arranged to provide for receipt and removal of a specimen of material to be tested and to maintain a confining fluid therein, the housing including a

cylindrical opening into said vessel that receives a piston slidably fitted therein, said cylindrical opening to include an intermediate enlarged annular portion; a piston for sliding installation within said cylindrical opening, said piston including, intermediate therealong, a collar formed to extend outwardly from the piston longitudinal surface that includes upper and lower faces; fluid passage means connecting said vessel to the cylindrical opening annular portion above said collar upper face for freely passing confining fluid therethrough; means for venting to atmosphere the cylindrical opening annular portion below said collar lower face; and seal means arranged to prohibit passage of confining fluid into said cylindrical opening annular portion below said piston collar lower face and from said cylindrical opening annular portion above said piston collar upper face to without the test cell.

4,679,442

ELECTROMAGNETIC FLOW METER

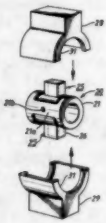
Yousuke Kubota, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 24, 1985, Ser. No. 813,136

Claims priority, application Japan, Dec. 26, 1984, 59-273491; Aug. 21, 1985, 60-181881

Int. Cl.[4] G01F *1/58*

U.S. Cl. 73—861.12 **11 Claims**



1. An electromagnetic flow meter is interposable between the flanged ends of upstream and downstream pipes conveying a fluid whose flow rate is to be measured, said flow meter comprising:

a detector body including

a measuring pipe made of a non-magnetic material having longitudinal end faces contacting said flanged ends of said conveying pipes and having a pair of diametrally opposed reinforcing portions parallel to the axis of said measuring pipe, said fluid flowing through said measuring pipe along said axis of said measuring pipe,

a pair of electrodes mounted in said measuring pipe and positioned on a first imaginary straight line orthogonal to said axis of said measuring pipe and passing through said reinforcing portions of said measuring pipe, said electrodes contacting said fluid flowing through said measuring pipe, and

a pair of magnetic flux generating units mounted on the outer surface of said measuring pipe, each of said magnetic flux generating units including a magnet core having coils wound thereon, each of said magnet cores having an axis positioned on a second imaginary straight line that intersects, at right angles, both said first imaginary line connecting said electrodes and said axis of said measuring pipe at a common point of intersection, said magnetic flux generating units generating magnetic field lines orthogonal to said first imaginary line and said axis of said measuring pipe; and

an outer casing enclosing the radial portion of sid detector body, said outer casing having longitudinal end faces substantially aligned with said longitudinal end faces of said measuring pipe.

4,679,443

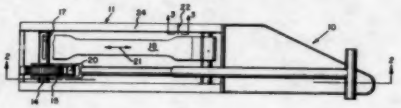
BELT TESTING DEVICE

Don S. Strader, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 24, 1986, Ser. No. 888,678

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—826 **5 Claims**



1. A belt testing apparatus for indirect measurement of tensile strength of a belt sample by direct measurement of the compressive strain on the apparatus, said apparatus comprising:

a frame having a pair of spaced apart rails, one of said pair of rails having a gap therein separating said one rail into a first portion and a second portion;

a stationary shaft rigidly fixed within said frame between said pair of spaced apart rails;

a rotatable shaft rotatably positioned within said frame at a predetermined distance from and generally parallel to said stationary shaft, said rotatable shaft being rigidly fixed at said predetermined distance from said stationary shaft and positioned on the opposite side of said gap from said stationary shaft;

a means for attaching said belt sample to said stationary shaft and said rotatable shaft;

a means for rotating said rotatable shaft; and

a strain sensing means positioned across said gap in said frame, said strain sensing means being adapted to sense the amount of compressive strain being exerted on said one of said pair of rails of said frame, said compressive strain being proportional to said tensile strength of said belt sample.

4,679,444

INSTRUMENT FOR MEASURING THE COHESION FORCE IN DENTAL CONE CROWNS

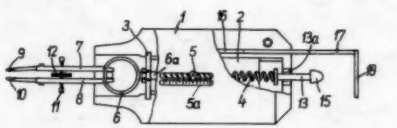
Silvan Kiefer, Pforzheim, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,170

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418503

Int. Cl.[4] G01L *5/00*

U.S. Cl. 73—827 **5 Claims**



1. An instrument for measuring the cohesion force between a dental outer crown and a dental inner crown connected to one another, comprising:

(a) a housing adapted to be manually grasped;

(b) scale means including a linearly extending helical spring means accommodated in said housing and indicator means for displaying the extent of compression or expansion of said spring;

(c) a divider-like gripping means attached to one end of said spring means and arranged for displacement relative to said housing; said gripping means including means for clamping the gripping means to one of the interconnected

crowns, whereby upon pulling apart the two components, said indicator means shows the extent of expansion of said helical spring means for determining the pulling force exerted on the inner and outer crowns at the moment of separation thereof; and

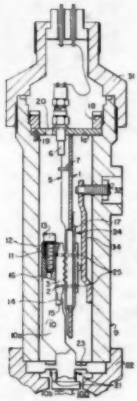
(d) pressing means for forcing the inner and outer crowns into engagement with one another; said pressing means being attached to one end of said spring means and being arranged for displacement relative to said housing, whereby upon pressing together the inner and outer crowns, said indicator means shows the extent of compression of said helical spring means for determining the pressing force exerted on the inner and outer crowns.

4,679,445

ON-LINE REPLACEMENT SENSOR ASSEMBLY FOR A VORTEX SHEDDING FLOWMETER

James K. Knudsen, East Greenwich, R.I.; Jane E. Smith, Mentor, Ohio; Victor J. Budan, Eastlake, Ohio; David J. Wroblewski, Willoughby, Ohio, and Eugene Skuratovsky, Mayfield Hts, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 3, 1986, Ser. No. 825,413
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **10 Claims**



1. A fiber optic sensor arrangement for easy removal from a vortex shedding flowmeter having a flowmeter housing which is exposed to a flowing fluid in a fluid space on one side of the flowmeter housing and the sensor on another side of the housing, comprising:

a sensor housing defining a sensor space on the other side of said flowmeter housing;

a sensor beam connected for movement to said sensor housing and having a first portion extending into said sensor space and a second portion extending through the flowmeter housing into the fluid space;

pressure boundary means connected to said beam for isolating said sensor space from the fluid space;

a mounting bracket detachably connected to said sensor housing; and

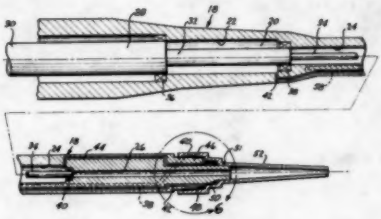
a fiber optic sensor element operatively connected to said first portion of said sensor beam and connected to said mounting bracket said sensor element being disposed in said sensor space between a pair of jaws independently mounted on said sensor beam and said mounting bracket and being operatively engaged for sensing movement of said beam with passage of vortices past said second portion of said beam in the fluid space, said fiber optic sensor element being removable from said housing with one of said pair of jaws and said mounting bracket without disturbing the flowing fluid in the fluid space on the one side of the flowmeter housing, said pressure beam, or said pressure boundary means.

4,679,446

MULTI-VOLUME DISPLACEMENT PIPETTE

Neil J. Sheehan, Berkeley; Jon E. Oppenlander, Lafayette, and Richard P. Fleenor, Monte Sereno, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 9, 1985, Ser. No. 773,954
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—864.13 **6 Claims**



1. A multi-volume displacement pipette assembly comprising:

a tubular body having a first end for receiving a plunger and a second end including tip mounting means for receiving a removable dispensing tip;

a first generally cylindrical chamber in the tubular body for holding a first volume of fluid, which first cylindrical chamber opens through the second end of the tubular body;

at least one second generally cylindrical chamber in the tubular body for holding a second volume of fluid and which is coaxially aligned with the first chamber, which second cylindrical chamber opens through the second end of the tubular body through a fluid pathway extending through the tubular body and interconnecting such at least one second cylindrical chamber with the second end of the tubular body;

a plunger assembly coaxial with the tubular body and operatively mounted therein for reciprocal, longitudinal movement through the first cylindrical chamber and such at least one second cylindrical chamber in the tubular body to displace or draw in fluid to such first cylindrical chamber and at least one second cylindrical chamber, the plunger assembly comprising a first portion having an external diameter substantially equal to the internal diameter of the first cylindrical chamber and at least one second portion coaxially aligned with the first portion and having an external diameter substantially equal to the internal diameter of such at least one second cylindrical chamber;

fluid sealing means between the first cylindrical chamber and such at least one second cylindrical chamber for preventing fluid communication between chambers but permitting reciprocal, longitudinal movement of the plunger assembly; and

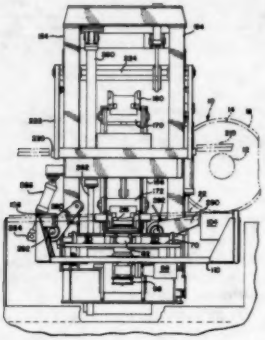
a removable dispensing tip means for mounting to the mounting means on the second end of the tubular body and which removable dispensing tip means selectively provides fluid flow through such fluid pathway extending through the tubular body and interconnecting such at least one second cylindrical chamber with the second end wherein said removable dispensing tip means comprises a generally conically shaped tubular body having a lumen extending therethrough, which lumen is coaxially aligned and in fluid communication with the first chamber, and a shoulder on the removeable dispensing tip means forming

a greater diameter portion of the lumen through the removable dispensing tip means, which greater diameter portion forms a seal with the second end of the tubular body to prevent liquid flow through the fluid pathway from such at least one second cylindrical chamber.

4,679,447
METHOD AND APPARATUS FOR POSITIONING AND TESTING RAILROAD WHEELS

Christopher Sieradzki, Homewood, and Lyman W. Jeffreys, Barrington, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 13, 1986, Ser. No. 817,921
Int. Cl.[4] G01M *19/00*; **G01N** *11/00, 11/30, 11/24*
U.S. Cl. 73—865.8 **20 Claims**



1. An improved method for positioning and testing railroad wheels, said method comprising:

moving a wheel to a first position with the wheel positioned upright in a vertical posture;

gripping the wheel about its rim and flange;

swinging the wheel about a spaced axis from said vertical posture to a substantially horizontal posture at a second position;

receiving said wheel in said horizontal posture upon horizontal receiving means at said second position;

lowering said wheel and receiving means to a third position below said second position with said wheel resting on a plurality of support means defining a horizontal plane;

rotating said support means and wheel about a vertical axis which is substantially central of said wheel; and gauging at least one of the upper surface and the rim surface of said wheel for warpage and rotundity respectively while being rotated.

4,679,448
SYSTEM FOR THE INTERNAL INSPECTION OF PIPELINES

Svend Lund, Birkerod, Denmark, assignor to Akademiet for de Tekniske Videnskaber, Svejsecentralen, Glostrup, Denmark

Filed Apr. 10, 1985, Ser. No. 721,678
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—866.5 **4 Claims**

1. A system for the internal inspection of a pipeline for carrying fluids, such as oil or gas, comprising:

an apparatus carrier to be inserted in the pipeline and travel inside the pipeline from point to point over considerable distances of several kilometers;

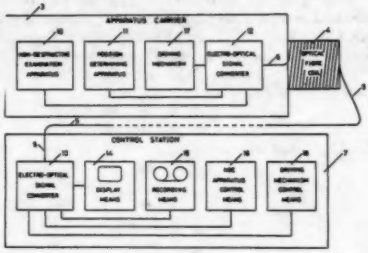
non-destructive examination apparatus mounted in said apparatus carrier to generate electronic measurement signals representative of at least one of the conditions of the pipeline wall material and surfaces;

position determining apparatus mounted in said apparatus carrier to generate electronic position representative of the successive positions of said apparatus carrier during said travel;

at least one first electro-optical signal converter installed in said apparatus carrier, said first electro-optical signal converter being connected to convert said electronic measurement signals and said electronic position signals into corresponding optical signals;

at least one second electro-optical signal converter situated outside a carrier launching end of the pipeline, said second electro-optical signal converter being connected to convert said optical signals into equivalent electronic signals;

at least one coil of expendable, thin optical fiber consisting of a single naked strand without supporting mantle having a length of several kilometers to be at least the same length



as the pipeline section to be examined, said coil being mounted on said apparatus carrier to gradually deposit said optical fiber inside said pipeline during said travel of said apparatus carrier, said optical fiber to remain in said pipeline after the internal inspection, said optical fiber being connected to transmit optical signals between said first electro-optical signal converter and said second electro-optical signal converter situated outside said carrier launching end of the pipeline; and

display and recording means situated outside said carrier launching end of the pipeline, said display and recording means being connected with said second electro-optical signal converter to receive said electronic signals and thereby generate displays and permanent recordings of the results of the inspection of the pipeline.

4,679,449
SPEED METER DRIVE DEVICE FOR AUTOMOBILE

Shuji Nagano; Shuichiro Ida, both of Toyota, and Toshio Yoshinaka, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 28, 1985, Ser. No. 738,227
Claims priority, application Japan, Feb. 12, 1985, 60-18738[U]
Int. Cl.[4] F16H *37/00, 1/16*
U.S. Cl. 74—12 **1 Claim**

1. A speed meter drive device for use with a vehicle comprising:

an output shaft projecting from a housing of a transmission or a transfer;

a connecting member mounted to a projected portion of said output shaft for transmitting a torque generated by said output shaft to another member;

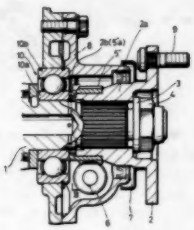
a speed meter driven gear adapted to be rotated in cooperation with rotation of said output shaft to drive a speed meter; and

a speed meter drive gear for rotating said speed meter driven gear;

wherein said speed meter drive gear is substantially cylindrical and is detachably mounted to an outer circumference of said connecting member, one end of said speed meter drive gear closest to said housing of said transmission or

said transfer is in abutment against an inner race of a bearing installed between said housing and said output shaft, and the other end of said speed meter drive gear is in abutment against a stepped portion formed on said connecting member;

further wherein said speed meter drive gear is keyed to an outer circumference of said connecting member only at



said one end of said speed meter drive gear, said speed meter drive gear including at least one projection which is keyed to at least one groove on said connecting member; and

further wherein end surfaces of said projection and said groove, farthest from said bearing, are separated from one another.

4,679,450

CONTROL SYSTEM FOR SELECTIVELY SWITCHABLE TWO/FOUR WHEEL DRIVE AUTOMATIC TRANSMISSION SYSTEM SHIFTING TRANSFER TRANSMISSION ACCORDING TO MAIN TRANSMISSION SPEED STAGE

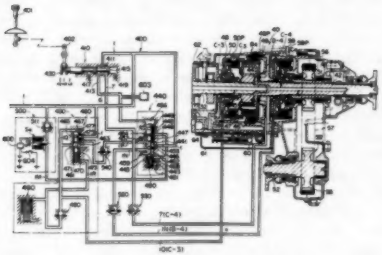
Yoichi Hayakawa; Masao Kawai, both of Anjo; Yutaka Taga, Toyota; Kazuaki Watanabe, Toyota, and Yoshiharu Harada, Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 24, 1985, Ser. No. 758,442

Claims priority, application Japan, Jul. 28, 1984, 59-157905

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—752 A **4 Claims**



1. For an automatic transmission system for a vehicle, comprising a main transmission unit which can be set to any one of a plurality of speed stages, an auxiliary transmission unit which is connected in series with said main transmission unit and can be selectively set to either a first speed reduction ratio or a second speed reduction ratio substantially larger than said first speed reduction ratio, and a means for manually controlling said auxiliary transmission unit to select either said first speed reduction ratio or said second speed reduction ratio,

a transmission control system comprising:

(a) a means for controlling said main transmission unit automatically to provide each selected one of said plurality of speed stages according to operational conditions of the vehicle; and

(b) a means for controlling said auxiliary transmission unit to override said manual control means in a manner only to prevent shifting of said auxiliary transmission unit to said second speed reduction ratio according to vehicle speed, throttle opening and according to which of said plurality of speed stages said main transmission unit is set,

wherein said override means includes means responsive to a specific combined range of vehicle speeds and throttle openings for each of said speed stages.

4,679,451

CASE FOR DRIVING SECTION OF LINEAR ACTUATOR

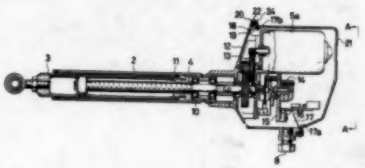
Kenichiro Nakamura, Moriyama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Apr. 21, 1986, Ser. No. 853,947

Claims priority, application Japan, Jul. 2, 1985, 60-100072[U]

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—606 R **4 Claims**



1. A linear actuator comprising: a body having a front portion and a rear portion, the front portion having an outer cylinder protruding therefrom, a screw shaft supported at its rear end in the outer cylinder, a nut threaded on the screw shaft, an inner cylinder secured to the nut and guided and slidable in the outer cylinder while being kept from rotating, and a motor within the body connected to drive the screw shaft, whereby the inner cylinder is movable back and forth into and out of the front end of the outer cylinder by rotation of the screw shaft, the rear portion of the body having an opening providing access to the interior of the body; and a cover closing said opening; the opening having a bottom edge, a top edge, and side edges, the top edge being located forward in relation to the bottom edge, and the side edges being inclined, whereby the opening faces both upwardly and rearwardly; the body having an outer surface surrounding the opening, said outer surface extending both downwardly and forwardly from the location of the opening; and the cover having a flange extending entirely around its periphery and overlying at least the part of said outer surface immediately adjacent to the opening; in which the bottom, top and side edges of the opening lie in a plane; in which the body has a face surrounding said edges, said face also lying in said plane; in which said outer surface is perpendicular to said plane, and in which said flange of the cover comprises a first portion parallel to and overlying said face, and a second portion parallel to and overlying said outer surface.

4,679,452

LIMIT SENSING DEVICE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 609,295, May 11, 1984, abandoned. This application Jul. 29, 1986, Ser. No. 892,732

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317888

Int. Cl.[4] F01B *25/26*; F16H *21/44*

U.S. Cl. 74—110 **7 Claims**

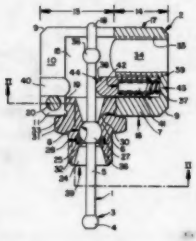
1. A mechanical limit sensing device for a piston and cylinder actuator, comprising:

a housing consisting essentially of a bearing sleeve adapted to be fixed to a cylinder of a piston and cylinder actuator, and a clamping body fixed at a variable rotational position to said bearing sleeve;

said bearing sleeve having an outer annular bearing collar engaged with said clamping body, an inner ball socket, an axial opening extending through said sleeve and through said ball socket having opposite truncated conical portions widening outwardly away from said ball socket, said bearing sleeve further including an outer end with an outer male thread adapted to be fixed to a cylinder of a cylinder and piston actuator, spaced away from said collar and away from said clamping body, said outer male thread being coaxial with said axial opening;

said clamping body having a slot therein with a cylindrical opening for receiving said collar, said slot dividing one end of said clamping body into two clamping jaws, said collar being disposed between said clamping jaws;

a clamping member connected between said clamping jaws for urging said clamping jaws together for fixing said clamping body to said bearing sleeve; and



a rocking lever extending through said sleeve and having a ball pivotally mounted to said ball socket of said sleeve for pivoting of said lever on said sleeve, said rocking lever having a first end extending outwardly from said sleeve in a direction away from said clamping jaw and an opposite end extending outwardly from said sleeve and through said slot, said slot being shaped to guide a pivotal movement of said opposite end of said lever, said one end of said lever being adapted to be engaged and pushed by movement of part of a piston and cylinder actuator and said opposite end of said lever being adapted to influence a switching element with pivoting said lever;

said clamping body including a portion from which said slot and said jaws extend, said portion of said clamping body including a bore therein lying in a plane of said slot and extending perpendicularly to said axial opening of said bearing sleeve, said slot including an enlarged opening communicating with said bore and into which said opposite end of said lever extends and is movable, said bore of said clamping body having a female thread therein for receiving a switching element.

4,679,453

APPARATUS FOR PRODUCING STEPWISE MOVEMENT

Masayuki Morita, and Masaichi Hattori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

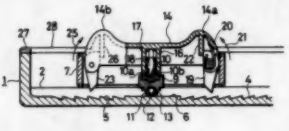
Filed May 31, 1984, Ser. No. 615,823
Claims priority, application Japan, Jun. 1, 1983, 58-98203
Int. Cl.[4] F16H *27/02, 31/00*
U.S. Cl. 74—128 **10 Claims**

1. An apparatus for providing stepwise movement of a holder along an elongated, stepped member, said apparatus comprising:

an elongated stepped member;

a holder disposed to move along said stepped member, said holder having at least one opening therethrough, with said opening being substantially normal to a surface of said stepped member along which said holder moves; and

at least one button mounted in said opening, said button including at least one claw pivotally affixed to said button, wherein depression of said button within said holder en-



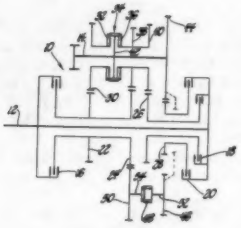
gages said claw in said stepped member such that further depression of said button causes said claw to pivot and move said button and said holder laterally stepwise along said stepped member and means for biasing said at least one button to a central position where each claw is out of engagement with said stepped member.

4,679,454

MULTI-RATIO TRANSMISSION

James C. Polak, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1985, Ser. No. 808,645
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—330 **3 Claims**



2. A preselected multi-ratio power transmission comprising; input means for transmitting drive forces; output means; first, second and third friction clutch means each selectively engageable with said input means for accepting drive forces therefrom, first input gear means drivingly connected with said first friction clutch means; second input gear means drivingly connected with said second friction clutch means; third input gear means drivingly connected with said third clutch means; first output gear means drivingly connected with said first input gear means; second output gear means drivingly connected with said first and second input gear means; third output means drivingly connected between said third input gear means and said output means; and one double-acting synchronizer clutch for selectively engaging said first output gear means with said output means and alternately said second output gear means with said output means, said first friction clutch means and said one double-acting synchronizer clutch cooperating during engagement to establish two forward drive ratios between said input and output means, said second friction clutch means and said one double-acting synchronizer clutch cooperating during engagement to establish two other forward drive ratios between said input and output means, said third friction clutch means being engageable to provide another forward drive ratio between said input means and said output means; and said one double-acting synchronizer clutch being relieved of transmitting drive forces during the engagement of said third friction clutch means and being manipulable for alternate connection with either said first output gear or

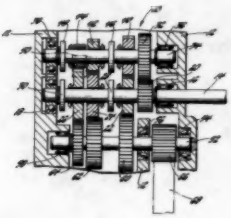
said second output gear while said third friction clutch means is engaged.

4,679,455

MULTIRATIO POWER TRANSMISSION

Laszlo Nagy, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1985, Ser. No. 747,793
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—359 **2 Claims**



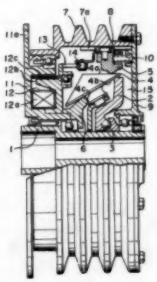
1. A plural step multiratio transmission comprising: an input shaft; an output shaft disposed parallel to and noncoaxial with said input shaft; a countershaft disposed parallel to and noncoaxial with both said input shaft and said output shaft; intermeshing head set gear means including gear means drivingly connected to said input shaft and countershaft respectively; output cluster gear means drivingly connected with said output shaft; three ratio gear means rotatably disposed on said input shaft and meshing with said output cluster gear means; three ratio gear means rotatably disposed on said countershaft and operatively connected through meshing relation with respective ones of said ratio gear means on said input shaft; and selectively engageable clutch means on said input shaft and said countershaft for selectively individually connecting said gear ratio means to the respective shafts for rotation therewith for providing a plurality of distinct gear ratios between said input shaft and said output shaft, said ratio gear means on said input shaft being idler gear means for the respective gear means on said countershaft.

4,679,456

AUXILIARY DEVICE DRIVING UNIT DRIVEN BY A VEHICLE ENGINE

Kazutoshi Kaneyuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1985, Ser. No. 809,786
Claims priority, application Japan, Dec. 17, 1984, 59-267968
Int. Cl.[4] F16H *15/16*
U.S. Cl. 74—752 D **7 Claims**



1. An auxiliary device driving unit connectable to an engine of a vehicle, which has an input shaft connected to a crank shaft of the engine, a pulley connected to auxiliary devices through belts and a transmission system for transmitting a rotational force from said input shaft to said pulley, characterized by comprising:

(a) a frictional transmission type stepless speed-change gear which is provided with an input-transmission member mounted on said input shaft, a plurality of conical planet cones which are rotated around their own axes by receiving a rotational force from said input-transmission member, an orbit ring as a stationary element having frictional engagement with said planet cones to guide the revolution of said planet cones, a speed-change ring which is in frictional contact with the frictional transmission surface including the cone generatrix of each of said planet cones and is shiftable in the direction of the axis of said input shaft, means for transmitting a rotational force of said speed-change ring to said pulley,

(b) a non-contact type electromagnetic brake attached to a fixed plate for supporting said orbit ring as a stationary element of said speed-change gear,

(c) a cam connected to a rotating element of said electromagnetic brake,

(d) a cam follower fixed to said speed change ring and being in contact with said cam, and

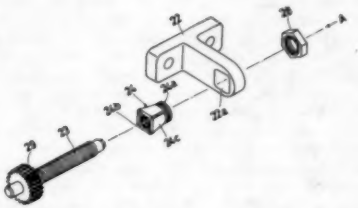
(e) an electric circuit for controlling said electromagnetic brake depending on the condition of operations of said auxiliary devices of the engine.

4,679,457

BACK-LASH ELIMINATING MECHANISM IN SCREW-TYPE DRIVING DEVICE

Masumi Nishikawa, Toyoake, and Masanobu Ishikawa, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 19, 1985, Ser. No. 713,754
Claims priority, application Japan, Mar. 21, 1984, 59-54762
Int. Cl.[4] F16H *25/24, 57/12*
U.S. Cl. 74—441 **5 Claims**



1. A back-lash eliminating screw-type driving device comprising:

a first bracket;

a second bracket movable relative to said first bracket, said second bracket having a generally prismoidal tapered hole therethrough, said hole being rectangular in cross section;

a screw member rotatably disposed on said first bracket;

a first nut member threadable engaging said screw member and disposed in said hole of said second blanket, said first nut member having an outer surface including a generally prismoidal tapered portion being rectangular in cross section and corresponding to the configuration of said generally prismoidal tapered hole and an integral threaded portion extending from the narrower end of said tapered portion, said first nut member also having axially and radially extending slits, one of said slits intersecting each corner of said outer surface of said prismoidal portion, said tapered portion and said tapered hole being dimensioned such that said tapered portion of said first nut

member slidably fits in said tapered hole and said threaded portion extends out of said tapered hole beyond the narrower end of said hole; and

a second nut member threadable engaging said threaded portion of said first nut member for drawing said first nut member axially within said tapered hole to urge opposing sides of said outer surface toward one another to cause said nut member to threadable engage said screw member more firmly.

4,679,458

WORM GEAR

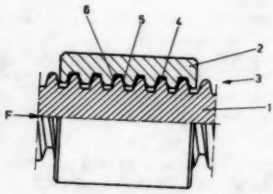
Manfred Brandenstein, Eussenheim; Norbert Klüpfel, Hambach; Gebhard Pape, Schweinfurt; Roland Haas, Hofheim, and Rolf Schmiechen, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 829,427

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505467

Int. Cl.[4] F16H *1/18, 55/08*

U.S. Cl. 74—458 **5 Claims**



1. In a worm gear having an outwardly directed thread on a spindle having first and second ends and a nut having a bore with an inwardly directed thread, said spindle being positioned inside said nut such that said outwardly directed and inwardly directed threads are intermeshed with both axial and radial play, the improvement wherein said spindle and nut have a first relative position in a state in which said first and second ends of said spindle are both subject to loading in a first radial direction with respect to the axis of the spindle and a second relative position different from said first relative position in a state in which said first and second ends of said spindle are subject to loading in opposite radial directions with respect to the axis of said spindle, thereby creating a torque, said spindle and nut having a relatively small axial play therebetween in said first state, said spindle having surface portions on said outwardly directed thread which transmit said torque between said spindle and nut, said torque transmitting surface portions being located only on a crown surface of said outwardly directed thread in respective thread areas in said second state, whereby said torque-transmitting portions of said crown surface of said outwardly directed thread are in contact with corresponding portions of a groove bottom arranged between said inwardly directed thread.

4,679,459

CONCAVE-CONVEX GEAR PAIR HAVING STAGGERED TEETH

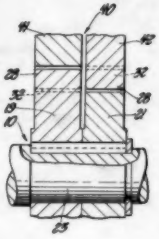
Erwin F'Geppert, Oakland County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1986, Ser. No. 855,869

Int. Cl.[4] F16K *55/17*

U.S. Cl. 74—460 **1 Claim**

1. In a speed change spur gear system, a pair of external spur gears having their teeth in meshed engagement; one spur gear having a relatively small diameter, and the other spur gear having a relatively large diameter; each spur gear being comprised of two axially aligned gear sections arranged so that the teeth on one gear section are circumferentially staggered from the teeth on the other gear section by a one half tooth spacing; the teeth on each one gear section having pressure faces that are convex in the radial plane; the teeth on each other gear section having pressure faces that are concave in the radial plane; the two spur gears being oriented so that the concave tooth surfaces on one gear are engaged with the convex tooth surfaces on the other gear, and the convex tooth surfaces on said one gear are engaged with the concave tooth surfaces on the other gear; the concave pressure faces being designed to



serve as drive surfaces or driven surfaces, the convex pressure faces being designed to serve as driven surfaces or drive surfaces; the curvatures on the gear teeth pressure faces being such that a unidirectional wiping action is produced as the pressure faces move against one another; the gear sections in each spur gear having substantially the same width in the axial dimension; each gear section being formed separately from its companion gear section; each spur gear comprising a mounting shaft and a pair of separately-formed gear sections keyed onto said shaft.

4,679,460

BRAKE LEVER DEVICE

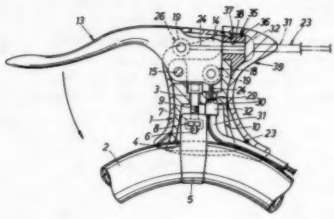
Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Higashi-Osaka, Japan

Filed Dec. 5, 1985, Ser. No. 804,784

Claims priority, application Japan, Feb. 2, 1985, 60-14483[U]

Int. Cl.[4] B62K *23/04;* **F16C** *1/10*

U.S. Cl. 74—489 **7 Claims**



1. A brake lever device comprising a cylindrical housing which is attached to project from a handle bar with a base opening of the housing removably held against the handle bar by a fastening band; a brake lever pivotally mounted on the housing for movement in a top of the housing; a Bowden cable connected for being operated by rotational operation of the brake lever;

wherein a first inner connector is provided on a lever base as a means for removably clamping an inner wire of the Bowden cable so as to draw the inner wire upwardly into the housing, upon rotation of the brake lever, and a second inner connector is provided on the lever base as a means for removably clamping the inner wire so as to draw the inner wire sidewardly into the housing, the inner wire

being selectively connectable to either of both said connectors;

wherein a port through which the Bowden cable is insertable is notched at a base edge of the housing close to the handle bar and a first outer receiver is provided in the housing at a position closer toward the handle bar than the first inner connector for receiving an outer sheath of the Bowden cable and through which the inner wire is introducable to the first connector, and a second outer receiver is provided on the top of the housing, at a position at an opposite side of the pivotal mounting of the lever from a hand manipulable portion of the lever, for receiving a terminal end of the outer sheath of the Bowden cable and through which the inner wire is introducable to the second wire connector; and

wherein the first inner connector comprises a freely rotatable roll connector having means for removably clamping a terminal end of the inner wire so that, upon pivoting of the lever, the inner wire, when introduced from said port will be pulled relative to the outer sheath, and the second inner connector comprises a freely rotatable roll connector having means for removably clamping said terminal end of the inner wire so that, upon rotation of the lever, the inner wire, when introduced at the housing top will be pulled relative to the outer sheath,

and wherein a removable rubber cover is provided for mounting over said outer surface of said housing when the Bowden cable is introduced through said port and said cover being removed when the Bowden cable is introduced at the top of the housing.

4,679,461

DRIVE DEVICE FOR TWO-SHAFT EXTRUDING MACHINE

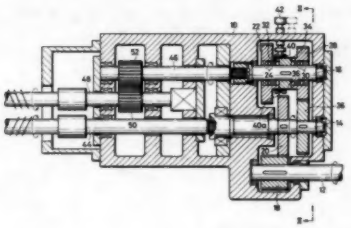
Hideki Mizuguchi; Haruo Yamaguchi; Seigo Hanada, and Nobuo Mukuda, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 780,755

Claims priority, application Japan, Oct. 17, 1984, 59-155743[U]

Int. Cl.[4] F16H *37/06, 3/14*

U.S. Cl. 74—665 GA **7 Claims**



1. In a two-shaft extruding machine, a drive device for driving a first (44) of two screw shafts of said machine directly and driving a second (48) of said screw shafts through an intermediate shaft (46) and a pair of meshed gears (50,52), the improvement wherein said drive device comprises: a first shaft (12); a second shaft (14) disposed coaxially with said first screw shaft and rotatable integrally therewith; a third shaft (16) disposed coaxially with said intermediate shaft and rotatble integrally therewith; a first gear (18) rotatable integrally with said first shaft; a second gear (20) rotatable integrally with said second shaft and meshed with said first gear; a third gear (22) rotatably supported on said third shaft and meshed with said first gear; a fourth gear (26) rotatable integrally with said second shaft; a fifth gear (28) rotatably support on said third shaft and meshed with said fourth gear; a claw clutch (32,34,30,40) for coupling a selected one of said third and fifth gears to rotate integrally with said third shaft, whereby said second screw shaft can be selectively driven in one of the same and the opposite directions as said first screw shaft is driven; a casing (10) inside of which portions of said first, second and third shafts which respectively support said first, second and fourth, and third and fifth gears, are rotatably disposed; means for rotatably supporting said first, second and third shafts inside said casing and an operating mechanism (42) for operating said claw clutch from outside said casing.

4,679,462

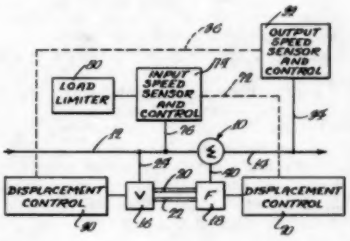
DIFFERENTIAL TRANSMISSION MECHANISM FOR A CONSTANT SPEED DRIVE

Stephen S. Baits, and Richard W. Reynolds, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 24, 1984, Ser. No. 685,474

Int. Cl.[4] F16H *47/04*

U.S. Cl. 74—687 **11 Claims**

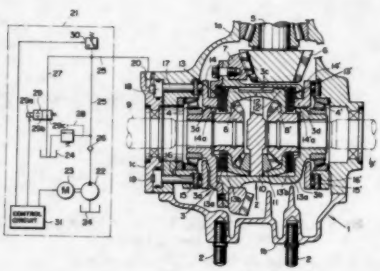


6. A hydraulic differential transmission comprising, a planetary gear differential having plural relatively movable elements with one element connected to a drive input, a second element connected to a drive output and a third element, a hydrostatic transmission having a pair of hydraulically interconnected hydraulic units, one of said hydraulic units being of variable overcenter displacement and connected to said drive input, the other of said hydraulic units being of variable displacement and connected to said third element of the planetary gear differential, means for controlling said variable overcenter displacement hydraulic unit to control the speed and direction of operation of the other hydraulic unit to maintain a constant speed of the drive output with a varying speed of the drive input between a first range of drive input speeds while said other hydraulic unit is set at maximum displacement, said other hydraulic unit operating between a maximum speed in one direction of operation and less than maximum speed in the other direction of operation as said first range of drive input speeds varies between a maximum and a minimum respectively, and means for selectively setting the displacement of said other hydraulic unit at any one of a plurality of different predetermined values whereby the displacement of said other hydraulic displacement unit may be reduced when the drive input is operating within a second range of drive input speeds lower than said first range to provide for operation of said other hydraulic unit at increased speed up to a maximum in said other direction of operation.

4,679,463
LIMITED SLIP DIFFERENTIAL

Kiyotaka Ozaki, Yokosuka City; Shuuji Torii; Tomio Jindo, both of Yokohama City, and Takashi Imaseki, Yokosuka City, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Aug. 29, 1985, Ser. No. 770,567
Claims priority, application Japan, Aug. 31, 1984, 59-181797; Oct. 23, 1984, 59-223487
Int. Cl.[4] F16H *1/45.5*
U.S. Cl. 74—711 5 Claims



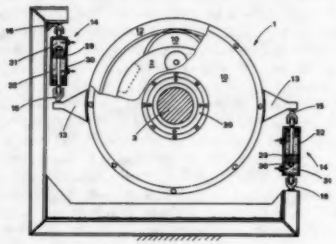
1. A limited slip differential for a vehicle comprising:
a casing adapted to be driven;
a pair of side gears retained within said casing;
a pinion gear retained within said casing and engaging said side gears to form a differential gear mechanism;
a pinion mate shaft supporting thereon said pinion gear and having a cam portion;
a pair of pressure rings retained within said casing having grooves engaged with said cam portion;
a pair of friction clutches interposed between said pressure rings and said casing; and
means for selectively applying a preload to said friction clutches through control of fluid pressure;
a housing within which said casing is retained;
a pair of roller bearings rotatably supporting said casing on said housing; and
a pair of reaction plates having annular body portions mounted on said casing for movement axially of said casing but against rotation relative to same and each having a portion disposed outside of said casing and a portion projecting inside of same to engage corresponding one of said friction clutches, one of said reaction plates being rotatably supported on said housing and the other being operatively connected to said means to receive a fluid pressure therefrom.

4,679,464
SHAFT-MOUNTED PLANETARY SPEED-REDUCING GEAR UNIT FEATURING A BALANCED, SELF-ALIGNING AND SELF-DISTANCING RING GEAR

Giovanni Castellani, 9, Via E. Orlandi, 41100 Modena, Italy

Filed Jan. 2, 1985, Ser. No. 688,829
Claims priority, application Italy, Jan. 24, 1984, 40007 A/84
Int. Cl.[4] F16H *57/08*
U.S. Cl. 74—788 2 Claims

1. A shaft-mounted planetary speed-reducing gear unit incorporating a balanced, self-aligning and self-distancing ring gear, and comprising a planet carrier (2) and an output shaft (3), with integral shafts (11) carrying planet pinions (10) which are turned by a sun gear (9) integral with a gear unit input shaft (8) and mesh with the internal teeth of a gear ring (12) fixed to a gear case wherein the gear ring (12) is connected by a pair of generally horizontal diametrically opposed appendages (13) to a pair of generally vertically-disposed hydraulic cylinders (14) located substantially parallel with each other at opposite sides of the gear unit and suspended by way of ball-and-socket joints (15 and 16) between the gear ring and a rigid structure; a piston (29) stroking with a barrel (30) of each hydraulic cylinder (14) separates a low pressure oil chamber (31) connected to a low pressure hydropneumatic accumulator (33) by a relative throttle valve (35) and a ball check valve (37), from a high pressure oil chamber (32) connected to a high pressure hydropneumatic accumulator (34) by a relative throttle valve (36) and ball check valve (38); the planet carrier (2), cantilevered at the end

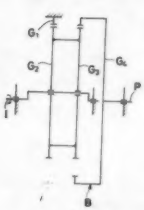


of the output shaft (3) of a driven machine (4) and equipped with a hub (24), joins with the gear unit input shaft(8) by way of a self-aligning roller bearing (17); the gear ring (12), whose internal teeth mesh with planet pinions (10) turning on the intergral shafts (11) by way of self-aligning roller bearings, is fixed to the gear case embodied in two halves: a first half (18) at the driven machine side joined to the periphery of the hub (24) of the planet carrier (2) by way of a rotary oil seal (20) and a second half (19) joining with the gear unit input shaft (8) by way of a rotary oil seal (21).

4,679,465
ECCENTRIC SWING GEAR TRANSMISSION

Yasuo Goto, 10-7,Minami-Ohi 4-chome, Shinagawa-ku, Tokyo, and Masao Adachi, 1598-68,Nogaya-cho, Machida-City, Tokyo, both of Japan

Filed Sep. 18, 1985, Ser. No. 777,427
Claims priority, application Japan, Sep. 20, 1984, 59-197256
Int. Cl.[4] F16H *1/28*
U.S. Cl. 74—805 2 Claims



1. A transmission which comprises eccentric swing gears composed of a speed change internal gear and a speed change external gear each having a pressure angle of a tooth form within 30° to 45° and an addendum h satisfying the relation of $m/2 > h > 0$ (m=module), said speed change external gear engaging with the speed change internal gear therein, and coupling gears composed of a coupling internal gear having a trapezoidal or a substantially trapezoidal tooth form and a coupling external gear similarly having a trapezoidal or a substantially trapezoidal tooth form and having the same number of teeth as said coupling internal gear, the coupling external gear engaging with the coupling internal gear therein, the tooth forms of said coupling internal and external gears being

molded so that the following relation may be satisfied between θ_1 and θ_2:

$$\theta_2 = (360°/Z \times \tfrac{1}{2}) + \theta_1$$

wherein Z represents the teeth number of said coupling internal gear and said coupling external gear, and θ_1 and θ_2 represent pressure angles of said coupling external gear and said coupling internal gear, respectively, said eccentric swing gears being connected to said coupling gears.

4,679,466

LINE PRESSURE CONTROL DEVICE FOR HYDRAULIC CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

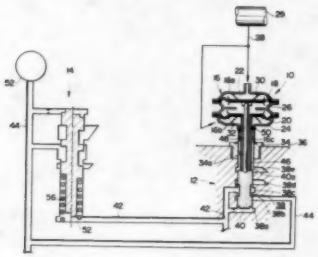
Haruyoshi Kumura, Yokohama; Keiju Abo, Yokosuka; Hiroyuki Hirano, Yokohama; Sigeaki Yamamuro, Zushi, and Masaki Nakano, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 28, 1986, Ser. No. 835,060

Claims priority, application Japan, Mar. 8, 1985, 60-44581; Apr. 1, 1985, 60-66567

Int. Cl.[4] B60K *41/04;* **F01B** *19/02*

U.S. Cl. 74—863 **12 Claims**



1. A line pressure control device for a hydraulic control system of an automatic transmission, comprising:

a fluid pump for producing a line pressure;

line pressure passage means connected to said fluid pump for distributing said line pressure;

a source of intake manifold vacuum;

a vacuum diaphragm unit connected to said source of intake manifold vacuum for producing a variable force depending upon variations of said intake manifold vacuum; and

a control valve connected to said line pressure passage means and having a valve spool movable to regulate said line pressure based upon said force applied thereto from said vacuum diaphragm unit;

said vacuum diaphragm unit including a casing having an inner wall, parallel first and second diaphragms disposed within said casing, vacuum chamber means defined within said casing by one side of said first diaphragm and by one side of said second diaphragm, atmospheric pressure chamber means defined within said casing by other sides of both said first and said second diaphragms in such a manner that said first diaphragm is subject to a differential pressure by which it is urged away from said valve spool while said second diaphragm is subject to a differential pressure by which it is urged toward said valve spool, spring means for urging said first diaphragm toward said valve spool while said second diaphragm moves away from said valve spool, and rod means for connecting said first and second diaphragms to said valve spool, in which said first and second diaphragms, said spring means and said rod means are constructed and arranged so that said force reduces as said intake manifold vacuum increases and is supplied from said first diaphragm to said valve spool through said rod means when said intake manifold vacuum is lower than a first predetermined value and so that said force increases as said intake manifold vacuum increases and is supplied from said second diaphragm to said valve spool through said rod means when said intake manifold vacuum is higher than a second predetermined value.

4,679,467

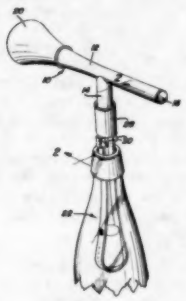
BROKEN CORK REMOVER

Thomas V. Delnero, 423 49th St., Apt. #1, West Palm Beach, Fla. 33407

Filed Mar. 20, 1986, Ser. No. 841,824

Int. Cl.[4] B67B *7/10*

U.S. Cl. 81—3.07 **2 Claims**



1. A tool for use in removing corks from bottles, said tool comprising an elongated handle including an elongated laterally projecting stem outwardly from said handle intermediate its opposite ends, opposite sides of said stem defining outwardly opening recesses formed therein, a flexible loop-forming band having generally parallel closely laterally spaced apart opposite ends between which said stem is receivable, the opposite ends of said band including inward projections receivable within said recesses, a sleeve mounted on said stem and shiftable therealong between an inactive position spaced along said stem toward said handle from said recesses exposing the latter for receiving said projections therein and allowing withdrawal of said projections therefrom and an active position shifted along said stem away from said handle with said sleeve registered with and extending lengthwise across said recesses closely outward of the corresponding ends of said band to prevent withdrawal of said projections from said recesses, and outward projections carried by said band ends spaced from the corresponding inward projections and engageable by the end of said sleeve remote from said handle to define a limit of movement of said sleeve along said stem to said active position.

4,679,468

POWER DRIVEN TRACK SHOE SPIKE SOCKET WRENCH

Barbara J. Gray, 14014 Goldenwood, San Antonio, Tex. 78249

Filed Jan. 15, 1982, Ser. No. 339,295

Int. Cl.[4] B25B *13/06, 21/00*

U.S. Cl. 81—121.1 **6 Claims**

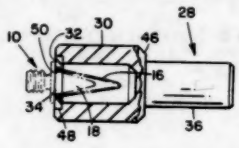
1. A socket wrench particularly adapted for changing track shoe spikes wherein said track-shoe spikes have engaging surfaces formed thereon and have a threaded portion for mating with threaded socket members disposed in track-shoe soles, and wherein said socket wrench is specially adapted for use in combination with an electric drill, comprising:

a first body member having an axial aperture formed therein of substantially circular shape adapted for insertion of the spike portion of a track-shoe spike;

engaging means adapted to mate with the engaging surfaces of the track-shoe spikes and disposed in said axial aperture

for engaging the engaging surfaces of the track-shoe spikes and wherein said engaging means is formed in a circular insert fixedly attached to the interior surface of said axial aperture; and

a second body member fixedly attached to said first body member and specially adapted for releasable engagement by the chuck of an electric drill, whereby a track-shoe spike may be changed by disposing said second body



member in the chuck of said electric drill, and disposing said first body member over the spike portion of a track-shoe spike until said engaging means engages the engaging surface of said track-shoe spike in such manner as to mate with the engaging surface about the circumference of the spike, and thereafter operating said electric drill so as to insert or remove said track-shoe spike from said socket member disposed in said track-shoe sole.

4,679,469

POWER TONGS CONTROLLER WITH PERSISTING TORQUE

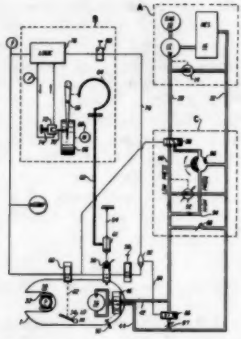
William E. Coyle, Sr., 3300 Sharon St., Houma, La. 70360

Continuation-in-part of Ser. No. 629,421, Jul. 10, 1984, Pat. No. 4,579,024, and Ser. No. 526,611, Aug. 26, 1983, which is a continuation-in-part of Ser. No. 487,048, Apr. 21, 1983, Pat. No. 4,552,041. This application Mar. 28, 1986, Ser. No. 845,521

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] B25B *23/151*

U.S. Cl. 81—470 **3 Claims**



1. A pipe make-up system comprising

fluid-driven power tongs having an inlet for driving fluid and an outlet for exhaust fluid,

means for supplying fluid under pressure to said inlet,

a normally closed valve disposed in a shunt between said inlet and said outlet,

a transducer connected to said tongs for generating a signal as a function of tongs torque,

means responsive to said transducer for opening said valve at a predetermined maximum tongs torque, thereby relieving the pressure differential between said inlet and said outlet, and

means for choking flow through said shunt so as to maintain residual tongs torque even after said valve is opened.

4,679,470

GUIDE-BAR DEVICE FOR MULTI-SPINDLE LATHE

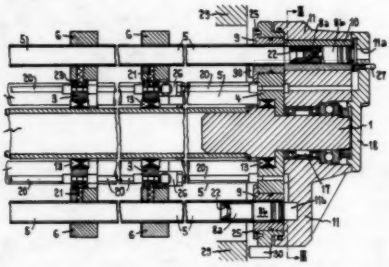
Markus Geiser, Pery, and Claude Vandevoir, La Neuveville, both of Switzerland, assignors to Sameca SA, Lamboing, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,383

Claims priority, application European Pat. Off., Nov. 5, 1982, 82810472.9

Int. Cl.[4] B23B *13/04*

U.S. Cl. 82—2.7 **17 Claims**



1. A guide-bar device for a multi-spindle lathe operable to simultaneously machine a plurality of bar of stock, said guide bar device including a rotatable barrel carried by and operable to be indexed by the multi-spindle lathe so as to progressively perform various machining operations on said bar stock as said barrel rotates, said guide-bar device further comprising:

a central shaft;

front disk means coaxially disposed about and supporting said shaft and adapted to be supported by said lathe;

a rear disk coaxially disposed about and supporting said shaft and adapted to be supported by said lathe;

at least one intermediate disk coaxially disposed about said central shaft;

a plurality of guiding tubes removably supported about said central shaft by means of said intermediate disk, said guiding tubes enclosing a bar sotck to be machined;

hydraulic means, for simultaneously supporting and advancing the bar stock in each of said guiding tubes, said hydraulic means including means for introducing hydraulic fluid into said guiding tubes and means for rotatingly supporting a rear part of the bar stock in each of said guiding tubes and for progressively advancing the bar stock in each of said guiding tubes during said machining;

at least one source of hydraulic fluid;

a hydraulic fluid distributor connected to said source of hydraulic fluid; said hydraulic fluid distributor including means for distributing the hydraulic fluid to said hydraulic fluid introducing means and to said means for rotatingly supporting and advancing the bar stock.

4,679,471

LATHE FOR GENERATING ASPHERICAL SURFACES

Stirling G. Wauchope, and Malcolm J. McLean, both of Oxford, England, assignors to Robertson Engineering (Thame) Limited, Oxford, England

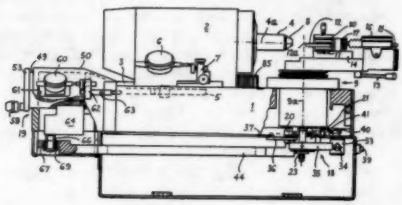
PCT No. PCT/GB84/00317, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01237, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 19, 1984, Ser. No. 740,271

Claims priority, application United Kingdom, Sep. 19, 1983, 8325027

Int. Cl.[4] B23B *5/40*

U.S. Cl. 82—12 **12 Claims**



1. A lathe for cutting an aspherical surface on a workpiece, comprising in combination:

headstock means having rotatable spindle means adapted to mount a workpiece for rotation about the axis of said spindle means,

radius cartridge means including tool posts means and pivot means for said radius cartridge means, whereby said radius cartridge means is swingable on said pivot means and is adapted to move a cutting tool mounted in said tool post means in contact with said workpiece and along an arc of predetermined radius transversely to said spindle axis of said headstock means,

said headstock means and said radius cartridge means being mounted for linear movement relatively to one another substantially parallel to said spindle axis of said headstock means, and

coupling means coupled to said pivot means and operated in response to turning of said pivot means upon swinging of said radius cartridge means to produce and control linear displacement of said headstock means and said radius cartridge means relatively to one another, whereby said cutting tool mounted in said tool post means is arranged to cut a predetermined aspherical surface on said workpiece.

4,679,472

METHOD AND APPARATUS FOR MACHINING THE CIRCUMFERENCE OF OUT-OF-ROUND WORKPIECES, PARTICULARLY PISTON RINGS

Otto Feller, Leichlingen; Manfred Brocksieper, Hückeswagen, and Rolf Lückger, Cologne, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 809,871

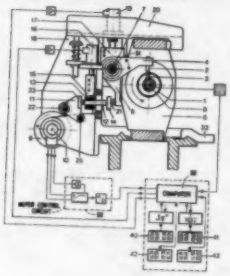
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447234; Dec. 7, 1985, 3543407

Int. Cl.[4] B23B *5/26, 5/24*

U.S. Cl. 82—19 **21 Claims**

1. In an apparatus for machining the circumference of a workpiece to provide the workpiece with a predetermined out-of-round contour, the apparatus including a copying disc having a basic out-of-round contour, a first motor to rotationally drive the copying disc, a tool handler which is mounted to be radially displaceable relative to the workpiece axis, transfer means including a double lever for transferring the basic out-of-round contour to the tool holder, and a second motor running synchronously with the first motor to rotationally drive the workpiece, the improvement wherein:

the predetermined out-of-round contour deviates from the basic out-of-round contour of the copying disc by predetermined lead or lag difference angle values, wherein the stator or one of the motors is rotatably mounted, and wherein the apparatus further comprises means for con-



trolling the rotary position of said stator of said one of the motors by the respective lead or lag difference angle values.

4,679,473

SHEARING MACHINE

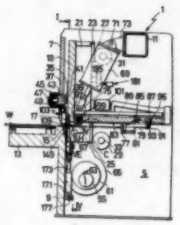
Tadashi Hirata, Yamato; Hidekatsu Ikeda, Hatano; Yoshitaka Arima, and Yoshihiko Kashihara, both of Isehara, all of Japan, assignors to Amada Company, Limited, Japan

Filed Nov. 6, 1984, Ser. No. 668,837

Claims priority, application Japan, Nov. 9, 1983, 58-172285

Int. Cl.[4] B23D *33/08, 33/10, 15/06*

U.S. Cl. 83—157 **20 Claims**



1. A shearing machine, comprising:

a frame;

a work-table provided integrally on the frame;

a lower blade detachably fixed to the work-table at the level of the work-table;

an upper blade;

a ram supported on said frame for vertical movement with respect to said lower blade, said ram holding the upper blade for performing shearing operations in cooperation with the said lower blade;

upper and lower rear guide means provided on the frame to guide the upper and lower rear portions of the ram;

front guide means supported on the frame above the work-table to guide the front portion of the ram;

a driving means for driving the ram supported on the frame beneath the ram but slightly more rearward than the plane of the vertical movement of the ram; and

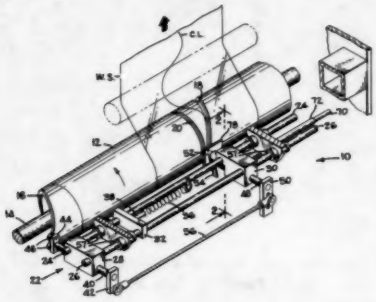
connecting rod means connecting the driving means to the ram at a position which is higher than the lower guide means and lower than the front guide means.

4,679,474

CUTTING THERMOPLASTIC WEBS

Emiel Lambrecht, Gijzegem-Aalst, Belgium, assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 6, 1985, Ser. No. 806,234
Int. Cl.[4] B26D *7/10*
U.S. Cl. 83—171 **2 Claims**



1. In a thermoplastic web slitting machine having a rotatable drum supporting a web passing thereover and a knife having its cutting edge received in a continuous groove formed in the surface of the drum and a knife holder for mounting said knife so that its cutting edge is maintained in the circumferential groove, the improvement comprising:

a source of heated fluid including a heater, a pressure regulator and a flow regulator;

conduit for receiving and delivering said heated fluid, said conduit having a portion thereof slidably mounted in an L-shaped pipe;

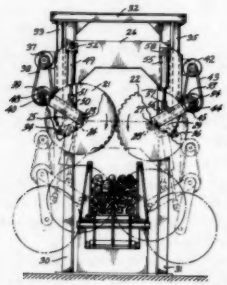
a discharge hood secured to the end of said L-shaped pipe whereby heated fluid flowing thereto is directed to said knife holder.

4,679,475

LOG-BUNDLING AND CUTOFF APPARATUS

Luis F. Antezana, Mercer Island, Wash., assignor to Nicholson Manufacturing Corporation, Seattle, Wash.

Continuation of Ser. No. 705,954, Feb. 27, 1985, abandoned.
This application Oct. 31, 1986, Ser. No. 924,103
Int. Cl.[4] B27B *1/00, 5/02*
U.S. Cl. 83—420 **8 Claims**



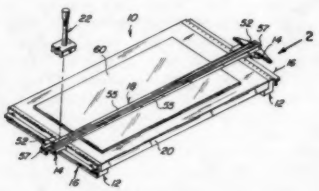
1. Cutoff mechanism for cutting bundled logs into bolts comprising a deep trough conveyor having a generally flat bottom and opposite upright sides with a rise at least approximately as great as the horizontal width of said conveyor for receiving a plurality of logs with their lengths generally in registration to form a log bundle in said trough conveyor composed of several superposed layers of logs, and log bundle cutoff means adjacent to and beyond the discharge end of said deep trough conveyor and including a frame having two guide columns spaced apart horizontally a distance greater than the width of said deep trough conveyor, support means guided for elevational movement by said guide columns, two circular cutoff saws mounted on said support means in side by side substantially coplanar relationship with adjacent portions of their peripheries in overlapping relationship substantially centrally over said trough conveyor, and actuating means for moving said support means downward relative to said frame to effect descent of said cutoff saws from an upper position in which the overlapping portions of said saws are higher than the logs in said trough conveyor, for cutting bolts as the support means descend first from the logs in the upper outer corners of the bundle of logs in said deep trough conveyor and then from logs inward and downward from such upper outer corners to enable outer bolts to fall away from the log bundle before inner bolts for freeing inner bolts from laterally outward restraint on being severed, to a lower position in which the overlapping portions of said cutoff saws are lower than the bottom of said trough conveyor for cutting bolts from the logs in the lowest layer of the log bundle in said deep trough conveyor from its outer edges toward its central portion.

4,679,476

SCORING GUIDE AND GLASS CUTTER SYSTEM

Edward Abreu, 5707 13th Ave. - 2nd Floor, Brooklyn, N.Y. 11219

Filed Apr. 3, 1986, Ser. No. 847,771
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—886 **2 Claims**



1. A scoring guide and glass cutter system comprising:

(a) a pair of base members with an L-shaped cross section of predetermined length;

(b) a cutting board disposed in said base members;

(c) a guide mechanism carried by said base members;

(d) a guide bar mounted on said guide mechanism; and

(e) a holder containing a glass cutter for disposition in said guide bar for coaction with a plate of glass, wherein said holder is comprised of:

(i) a handle tubular in form within which is positioned the glass cutter; and

(ii) a base fixedly attached to said handle with a pair of slots perpendicular to said handle, which coact with said guide bar and through which the glass cutter extends to coact with the glass plate when plate is positioned on said cutting board.

4,679,477

PERCUSSIVE ACTION SILENT ELECTRONIC KEYBOARD

Charles Monte, 901 E. Walnut Ave., Burbank, Calif. 91501

Filed Jun. 20, 1985, Ser. No. 746,844
Int. Cl.[4] G10H *1/34, 1/46*
U.S. Cl. 84—1.1 **6 Claims**

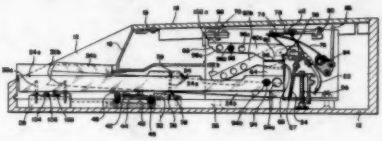
1. A percussive action silent electronic keyboard for play as a musical instrument and providing electrical input signals for electronic music synthesis equipment which generates music

electronically in response to play action of the keyboard, said keyboard comprising:

a housing;

a keyboard array of a plurality of depressable pivoted playing keys adjacently arranged as a musical keyboard,

each said key communicating with a pivoted, freely moveable silent hammer in a cam and follower arrangement, each said hammer comprising a butt portion and a flexible bridal strap attached at one end to said butt portion, and further including a leaf spring having one end secured to said housing and the other end free, another end of said



bridal strap being attached to said free end of said leaf spring,

stop means for stopping the momentum of each silent hammer which is caused to move freely about its pivot in a limited arc from a rest position to an impact position by following a camming surface of its corresponding key resulting from depressing of the key during playing action,

electrical switch means responsive to the playing action of said key for generating and supplying electrical signals indicative of said action to said electronic music synthesis equipment with which said keyboard may be used to generate music.

4,679,478

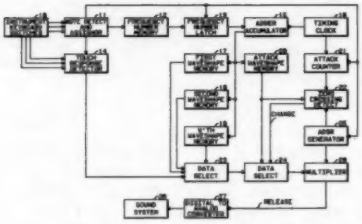
TOUCH RESPONSIVE MUSICAL TONE GENERATOR

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 6, 1986, Ser. No. 816,466

Int. Cl.[4] G10H *1/057, 1/46, 7/00*

U.S. Cl. 84—1.1 **23 Claims**



1. In combination with a keyboard operated musical instrument having an array of keyswitches, apparatus for producing a musical tone having a spectrum which is responsive to the manner in which the keyswitches are actuated comprising;

a keyswitch state detect means wherein a detect signal is generated in response to each actuated keyswitch in said array of keyswitches;

an encoding means for encoding each said detect signal to generate a detect data word which identifies each said actuated keyswitch corresponding to a generated detect signal;

a touch response means whereby a touch response signal is generated in response to the manner in which a keyswitch is actuated;

an assignor means responsive to each said detect data word whereby one of a plurality of tone generators is assigned to generate a musical tone associated with a corresponding keyswitch contained in said array of keyswitches and whereby said touch response signal and said detect data word are furnished to the tone generator assigned to the corresponding keyswitch; and

said plurality of tone generators each of which comprises,

an attack and decay waveshape memory means for storing sample values of a musical waveshape including the attack and decay phases of said musical waveshape,

a plurality of waveshape memory means each storing a plurality of sample values for a period of a musical waveshape having a preselected spectrum,

a memory addressing means responsive to said furnished detect data word whereby data values are read out from said attack and decay waveshape memory means and from said plurality of waveshape memory means at a memory address advance rate corresponding to the associated actuated keyswitch in said array of keyswitches,

a first data select means responsive to said furnished touch response signal whereby the plurality of sample values read out from a corresponding one of said plurality of waveshape memory means is selected,

a transition means whereby a change signal is generated in response to data values read out of said attack and decay waveshape memory means,

a second data select means whereby if said change signal is generated said plurality of sample values selected by said first data select means are selected and whereby if said change signal is not generated said data values read out from said attack and decay waveshape memory means are selected,

a conversion means for producing a musical tone responsive to the data selected by said second data select means thereby producing a musical tone having a spectrum which is responsive to the manner in which the keyswitch associated with an assigned tone generator is actuated.

4,679,479

ELECTRONIC DRUM

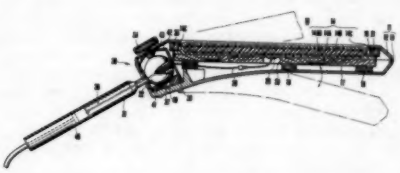
Hisakazu Koyamato, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamatsu, Japan

Filed Apr. 29, 1986, Ser. No. 857,165

Claims priority, application Japan, May 1, 1985, 60-92352

Int. Cl.[4] G10H *3/14*

U.S. Cl. 84—1.04 **11 Claims**



1. An electronic drum comprising:

a surface layer having a predetermined hardness for generating a vibration by a performer's strike thereto;

a base layer having a predetermined hardness formed to be spaced apart from said surface layer by a predetermined distance;

a coupling portion having a predetermined hardness for transmitting said vibration to said base layer so that said base layer is vibrated by said performer's strike;

an impact absorbing layer which fills the space defined by said surface layer, said coupling portion and said base layer for absorbing an impact of said performer's strike; and

a detection element mounted under said base layer for detecting the transmitted vibration via said coupling portion and for generating a detection signal responsive to said

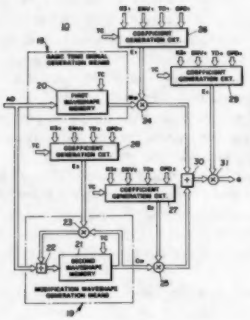
transmitted vibration so that said detection signal is responsive to said performer's strike.

4,679,480

TONE SIGNAL GENERATION DEVICE FOR CHANGING THE TONE COLOR OF A STORED TONE WAVESHAPE IN AN ELECTRONIC MUSICAL INSTRUMENT

Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 27, 1985, Ser. No. 770,308
Claims priority, application Japan, Aug. 31, 1984, 59-180429
Int. Cl.[4] G10H *1/12, 7/00*
U.S. Cl. 84—1.22 **9 Claims**



1. A tone signal device comprising:

basic tone signal generation means comprising a first waveshape memory for storing basic waveshape data representing a basic waveshape having plural periods and tone color which varies with time, said basic waveshape being formed from a part or plural parts of a full tone waveshape representing a musical tone from the start of sounding of the tone to the end thereof, and for generating a basic tone signal in accordance with said basic waveshape data read out from said first waveshape memory;

modification signal generation means comprising a second waveshape memory for storing modification waveshape data representing a modification waveshape having plural periods and tone color which varies with time, and for generating a modification signal in accordance with said modification waveshape data read out from said second waveshape memory;

weighting means for weighting said basic tone signal and said modification signal by individually using separate weighting coefficients;

weighting coefficient generation means for generating said separate weighting coefficients in response to tone color change parameters; and

combining means for combining said weighted basic tone signal and weighted modification signal to produce a modified tone signal.

4,679,481

SOUND ENHANCING DEVICE

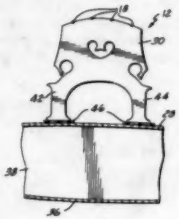
Richard Lozon, 14952 Stoneham, Riverview, Mich. 48192

Filed Apr. 18, 1986, Ser. No. 853,664
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—309 **10 Claims**

1. A sound enhancing device for a stringed musical instrument having a body portion and a plurality of strings running transversely to the axis of the stringed musical instrument along its top under tension, comprising:

a bridge being located between the strings and body portion of the stringed musical instrument; and

a bridge pad of a cold flowable material being situated between the bridge and the body portion of the stringed musical instrument for enhancing the mating relationship of the bridge to the body portion of the stringed musical instrument, whereby when the strings are under tension the bridge pad, as a result of the tension, cold flows to



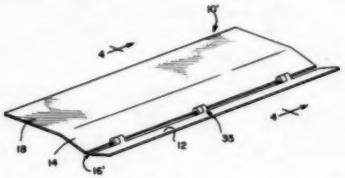
conform and distort to the contacting surfaces of the body portion of the stringed musical instrument and the bridge so that the string vibrations will be transmitted through the bridge to the body portion of the stringed musical instrument with clarity, tone and richness of the sound of the stringed musical instrument.

4,679,482

PIANO KEYBOARD SHIELD

Edward G. Simanski, 3005 Spruce Ave., Altoona, Pa. 16601

Continuation-in-part of Ser. No. 521,066, Aug. 8, 1983, which is a division of Ser. No. 385,509, Jun. 7, 1982, Pat. No. 4,419,921.
This application Jul. 23, 1985, Ser. No. 757,883
Int. Cl.[4] G09B *15/06*
U.S. Cl. 84—467 **12 Claims**



1. A keyboard shield adapted to be attached to a piano of the type having a laterally extending gap or slot in a vertical section located at the rear of the keyboard, said shield, when attached to the piano, including a cover section interrupting a player's line of vision to at least a portion of said keyboard, the improvement wherein said shield includes a rear section engageable within said slot for attaching the shield to the piano, said rear section being continuous laterally and connected to said cover section by a hinge.

4,679,483

DISPENSER AND DISPENSING CASSETTE

Josef B. V. Wrana, Spånga, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

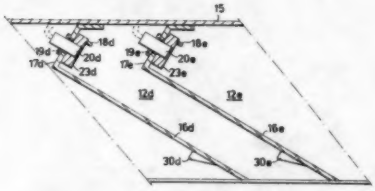
Filed Feb. 7, 1986, Ser. No. 827,120
Int. Cl.[4] B64D *1/02;* **F41F** *5/00;* **H01Q** *17/00*
U.S. Cl. 89—1.51 **4 Claims**

1. An improved dispenser adapted for mounting on an airplane wing for launching radar deflecting elements, such dispenser comprising a plurality of cells containing such deflecting elements and an electronic fire control unit for supplying firing signals to such cells to cause such deflecting elements to

be dispensed therefrom, such improvement being characterized in that each of said cells comprises:

a dispensing cassette detachably supported therein and containing at least two cartridges which respectively contain such deflecting elements, each cartridge having an electrical contact at one end thereof for receiving a firing signal for launching the deflecting elements therein;

electrical coupling means connected to said electronic fire control unit;



guide means in said cell adapted to engage corresponding guide means on said cassette when said cassette is substantially fully inserted into said cell, such cell guide means and cassette guide means cooperating to ensure that when inserted in said cell said cassette is positioned therein so that the electrical contacts of the cartridges in the cassette engage said electrical coupling means to receive said firing signals from said fire control unit; and

locking means for detachably securing said cassette within said cell.

4,679,484

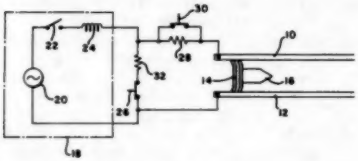
ELECTROMAGNETIC LAUNCHER RAIL TEMPERATURE REDUCTION THROUGH CONTROLLED BREECH CURRENT INJECTION

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 6, 1984, Ser. No. 638,329

Int. Cl.[4] F41F *1/02*

U.S. Cl. 89—8 **4 Claims**



1. An electromagnetic projectile launching system comprising:

a pair of conductive rails;

means for conducting current between said rails and for propelling a projectile along said rails;

a source of electric current; and

a resistor connected electrically in parallel with a switch to form a circuit which is electrically connected between said rails such that the opening of said switch commutates current from said current source to said rails, wherein said resistor is composed of temperature dependent resistive material which increases in resistance as its temperature rises, thereby increasing the current injected into said rails.

4,679,485

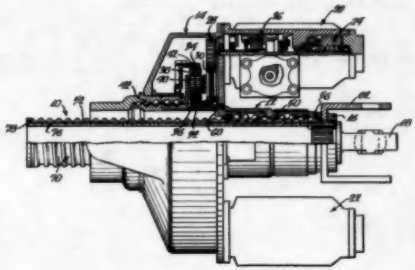
BALLISTIC TOLERANT DUAL LOAD PATH BALLSCREW AND BALLSCREW ACTUATOR

Jeffrey D. Nelson, Rockford, and John F. Scanlon, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1984, Ser. No. 686,983

Int. Cl.[4] F41H *5/04*; F16H *1/18*

U.S. Cl. 89—36.02 **38 Claims**



1. A ballistic tolerant dual load path ballscrew actuator comprising, a selectively driven ballnut and a ballscrew drivingly connected to said ballnut, said ballscrew having an outer tubular member of a hardened metal material to withstand high contact loads and having an external helical ball groove providing a primary load path and an inner tubular member closely fitting within and fixed to the outer tubular member to provide a secondary load path upon cracking of the outer tubular member by a projectile passing through the outer tubular member, said inner tubular member being formed of a rigid ballistic tolerant composite nonmetallic material to maintain its structural integrity when contacted by said projectile which has passed through and caused cracking of the outer tubular member and which, by being fixed to the outer tubular member, maintains the overall length of the outer tubular member and prevents propagation of said crack.

4,679,486

COMBINATION GUN WITH REPEATER MECHANISM

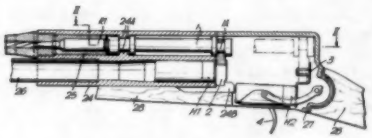
Viggo Landaas, 3740 Lunde, Norway

Filed Mar. 4, 1985, Ser. No. 708,050

Claims priority, application Norway, Mar. 7, 1984, 840857

Int. Cl.[4] F41F *11/04, 13/04*

U.S. Cl. 89—126 **4 Claims**



1. A gun having a first barrel and a second barrel of different caliber, each barrel having a chamber end, a receiver having sections for guiding and latching first and second interconnected breech blocks, a repeater mechanism, a barrel selector mechanism which brings one barrel into an inoperative state while simultaneously putting the other barrel into an operative state, characterized in that the chamber end of said first barrel is located forward relative to the chamber end of the second barrel by a distance at least corresponding to the overall length of the longest cartridge to be used by one of the barrels, and that the length of the breech block of the second barrel and the corresponding receiver section is reduced at least by the same

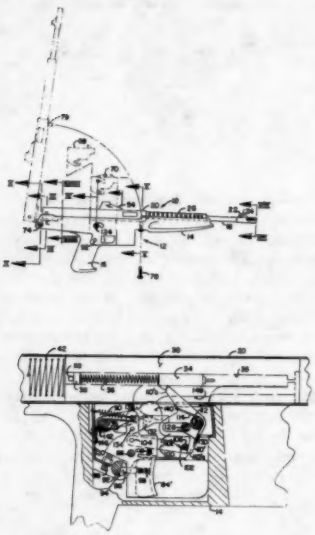
distance, thereby achieving weight savings and overall length reduction.

4,679,487

PROJECTILE FIRING WEAPON WITH A REPLACEABLE FIRING MECHANISM ACTUATOR CASSETTE

Walter R. Houseman, League City, Tex., assignor to Custom Technical Enterprises, League City, Tex.

Filed Jun. 12, 1984, Ser. No. 619,926
Int. Cl.[4] F41D *11/02*
U.S. Cl. 89—140 3 Claims



1. A replaceable firing mechanism actuator cassette for a projectile firing weapon having a barrel, grip means and a firing pin comprising:

(a) a cassette body defining an interior space;

(b) a trigger pivotally attached to the cassette body;

(c) a sear pivotally attached to the cassette body, a portion of the sear projecting from the cassette body so as to engage a firing pin of the weapon;

(d) a pawl attached to the trigger and engaging the sear such that, as the trigger is pivoted about its attachment, the pawl causes the sear to pivot about its attachment to thereby disengage it from the firing pin;

(e) first spring means biasing the sear toward a first position in which it engages the firing pin;

(f) a pawl cam surface defined by the pawl;

(g) a pawl actuator pin attached to the cassette body such that it bears against the pawl cam surface, the interengagement of the pin and the pawl cam surface causing the pawl to disengage from the sear after a predetermined amount of travel;

(h) a trip actuator lever pivotally attached to the cassette body and defining a trip lever cam surface;

(i) a sear actuator link pivotally attached to the trigger and bearing against the trip lever cam surface; and,

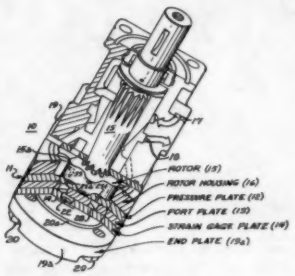
(j) selector means to engage and disengage the sear actuator link and the sear, such that the weapon operates in a fully automatic mode when the sear actuator link and the sear are engaged, and a semi-automatic mode when the sear actuator link and the sear are disengaged.

4,679,488

INTEGRAL ROTATIONAL DISPLACEMENT SENSOR FOR AN HYDRAULIC MOTOR

Gary Krutz, 605 Northridge Dr., West Lafayette, Ind. 47906, and David L. Hansen, 909 E. 24th St., Apt. C, Hutchinson, Kans. 67502

Filed Dec. 4, 1985, Ser. No. 805,119
Int. Cl.[4] F01B *31/12*
U.S. Cl. 91—1 22 Claims



1. Apparatus for determining a variety of operating parameters, including incremental rotational movement, speed and torque, of a fluid motor having a rotating assembly including a rotor and a rotor housing comprising: pressure sensing means and pressure coupling means interposed between said rotating assembly and said pressure sensing means for communicating to said pressure sensing means variations in pressure produced in a plurality of areas within the motor in response to rotation of the rotor within the rotor housing, said pressure sensing means producing a pressure signal indicative of the pressure variations, and said pressure coupling means including a plurality of apertures for selectively coupling pressure variations from at least two of said areas at a time to said pressure sensing means whereby the pressure signal produced by said pressure sensing means is defined by at least three states, permitting at least incremental movement of the rotor to be determined from the pressure signal.

4,679,489

AUTOMATIC LEVELING SYSTEM FOR BLAST HOLE DRILLS AND THE LIKE

Richard A. Jasinski, Oak Creek, and Donald M. Mains, Greendale, both of Wis., assignors to Becor Western Inc., South Milwaukee, Wis.

Filed Nov. 4, 1985, Ser. No. 794,778
Int. Cl.[4] F15B *21/02, 11/22*
U.S. Cl. 91—36 13 Claims

1. A leveling system for a blast hole drill or the like having a base plane comprising:

jack means spaced from one another defining first and second axes in the base plane which are generally transverse to each other;

fluid supply means operatively connected to said jack means;

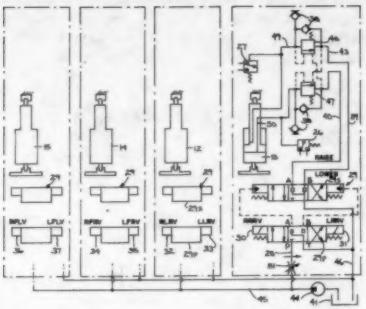
valve means connected to said fluid supply means and said jack means;

sensor means adapted to continuously detect the attitude of the base plane along the first and second axes;

said sensor means including a first sensor device to detect an attitude within a fine level range and a second sensor device to detect an attitude outside a coarse level range; and

control means operatively connected to said sensor means and said valve means to provide a raising or lowering mode of operation of said jack means in conjunction with

said first sensor device and a constant releveling mode of operation in conjunction with said second sensor device



wherein said constant releveling is defined by an interruption of said raising or lowering mode.

4,679,490

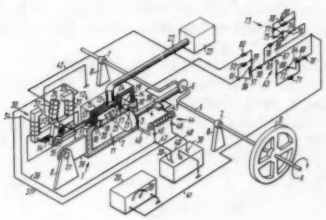
OSCILLATOR RECIPROCATION CONTROL SYSTEM FOR PISTON MOTOR

Leonid P. Russin, ulitsa Nelidovskaya, 22, kv. 18, Moscow, U.S.S.R.

Division of Ser. No. 318,569, Nov. 5, 1981, Pat. No. 4,487,107, which is a continuation of Ser. No. 45,674, Jun. 5, 1979, abandoned. This application Sep. 12, 1984, Ser. No. 649,668

Int. Cl.[4] F01L *15/00, 33/00;* **F15B** *13/16*

U.S. Cl. 91—189 R **4 Claims**



1. Apparatus for controlling the revolution of the drive shaft of an engine comprising:

an actuating cylinder;

a piston with rod, serving as an actuating member, mounted for reciprocation inside said actuating cylinder and dividing the cavity of said cylinder into a rodless cavity and a rod cavity;

a source of working fluid;

a valve distributor serving as a switching member and communicating each one of said cavities, namely, the rod cavity and the rodless cavity, with said source of working fluid;

a valve in said valve distributor;

a crank member serving as a converter of reciprocation of said piston to revolution of a drive shaft and effecting the kinematic coupling of said rod with said drive shaft;

an electric oscillator whose frequency is variable in accordance with a preset r.p.m. of said drive shaft;

a converter in the form of a linear dynamic link coupled electrically with said oscillator and mechanically with said valve of said valve distributor;

a transducer of the current value of the piston position relative to its neutral position, said transducer being coupled by means of negative electric feedback to said converter;

said negative electric feedback being formed by a first operational amplifier having a non-inverting input connected to said oscillator, an inverting input connected to said transducer, and an output connected to said converter;

a three-way switch for stopping the engine in the neutral position of said piston and for changing the direction of said drive shaft rotation, said switch being connected to a circuit formed by said electric oscillator and said first operational amplifier; and

a second operational amplifier, said three-way switch in one of its positions acting to break said circuit formed by said oscillator and said first operational amplifier, in a second position acting to directly connect said oscillator and said amplifier, and in a third position being connected with an output of said second operational amplifier whose inverting input is connected to said electric oscillator.

4,679,491

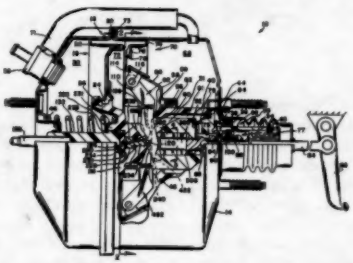
REACTION MECHANISM FOR TANDEM BRAKE BOOSTER

Robert K. Wilson, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 4, 1985, Ser. No. 795,304

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369 A **8 Claims**



1. A reaction mechanism for a tandem brake booster having first and second walls that move in opposite directions within a cavity to produce first and second output forces in response to an input force applied to a control member and a force transmitting lever arrangement through which said second output force is presented to an output member and combined therein with said first output force to create a joint output force, said force transmitting lever arrangement having first and second arm means each of which has a first and connected to said second wall, a fulcrum, and a second end connected to said output member, each of said arm means having a first cam surface that engages said fulcrum and a second cam surface that engages said output member, said first and second cam surfaces directing said second output force along a force vector substantially parallel to said output member to prevent the introduction of forces that may rotate said first wall, the improvement comprising:

a first plunger carried by said first wall and having a projection that extends therethrough, said projection having a slot extending from the end thereof for a set distance;

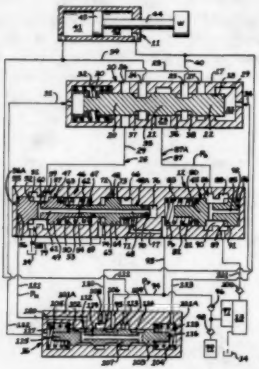
a second plunger carried by said control member; and

reaction lever means having third and fourth arm means each of which has a first end connected to said second wall and a second end located in said slot in said projection on said first plunger, said first plunger responding to said joint output force by moving to provide said second end of said third and fourth arm means with a reaction force, said reaction force being transmitted into said second plunger to balance said input force; said slot providing a guide for the second ends of the third and fourth arm means to assure that the reaction force is transmitted to the second plunger without the introduction of moments.

4,679,492
COMPENSATED FLUID FLOW CONTROL VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 21, 1986, Ser. No. 887,590
Int. Cl.[4] F15B *13/08*
U.S. Cl. 91—420 **38 Claims**



1. A valve assembly interposed between a fluid motor operable to control positive and negative loads and subjected to positive and negative load pressure, fluid exhaust means, including reservoir means and a source of pressure connected to a pump, first valve means operable to selectively interconnect said fluid motor with said exhaust means and said source of pressure, positive load pressure control means between said fluid motor and said pump, negative load pressure compensating control means between said fluid motor and said exhaust means, said negative load pressure compensating control means including fluid outflow metering orifice means, first regulating means of the throttling action of throttling member means operable to control the flow of fluid through any specific flow area of said fluid outflow metering orifice means at a relatively constant control pressure differential independent of the magnitude of said negative load pressure, and second regulating means operable to increase said control pressure differential acting across said fluid outflow metering orifice means with increase in pressure at said positive load pressure control means whereby fluid flow through said fluid outflow metering orifice means becomes independent of the magnitude of said negative load pressure and can be increased with the increase in pressure at said positive load pressure control means during control of said negative load.

4,679,493
REINFORCED PISTONS

Robert Munro, and Roger A. Day, both of Lymington, England, assignors to AE PLC, Warwickshire, England

Filed Apr. 25, 1985, Ser. No. 727,336
Claims priority, application United Kingdom, May 1, 1984, 8411074
Int. Cl.[4] F16J *1/01*
U.S. Cl. 92—212 **18 Claims**

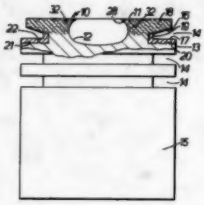
1. A piston for an internal combustion engine formed of a light metal or metal alloy and comprising:

a crown having an upper surface,

a ring band extending around the crown and including at leat two piston ring grooves,

each of said at least two piston ring grooves having upper and lower generally radially extending surfaces,

one of said piston ring grooves being closely adjacent said crown and having at least the lower radially extending surface thereof formed by a wear-resistant insert which is cast into the piston,

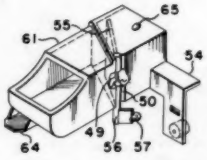


at least a portion of the crown including a fibre reinforcement which contacts the insert and which is between the insert and an upper surface of the crown said at least a portion of the crown being of minimum axial thickness, to prevent the separation of said insert from the crown in an axial direction while allowing the upper piston ring groove to be close to the upper surface of the crown.

4,679,494
DAMPER DEVICE FOR AN AIR CONDITIONING APPARATUS

Kaneo Katayama, Yaizu, and Yasuhiko Hashimoto, Fujieda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,103
Claims priority, application Japan, Nov. 27, 1984, 59-179615[U]; Jun. 5, 1985, 60-84787[U]
Int. Cl.[4] F24F *1/02*
U.S. Cl. 98—38.6 **6 Claims**



1. A damper device for an air conditioning apparatus provided with an internal air circulating part adapted to suck room air to pass it in a heat exchanger thereby effecting heat exchanging and to discharge the heatexchanged air into a room, characterized by comprising

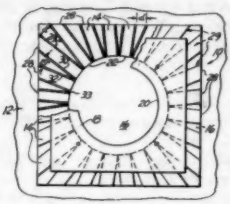
(a) a duct for communicating said air circulating part with the exterior of said air circulating part, said duct being provided in its side wall with a slit having a predetermined length and a recess adapted to receive a pivotal shaft, and

(b) a damper placed in said duct to adjust an air flow rate between said air circulating part and the outside of the air conditioning apparatus, said damper comprising an opening and closing part extending in said duct through said slit so as to open and close said duct, a shaft member which is formed at one end of said opening and closing part and which is pivotally supported in said recess, and a cable connecting part to which a cable to operate said shaft member is connected.

4,679,495
AIR DIFFUSER

Howard W. Locker, 820 N. Ocean Blvd., Delray Beach, Fla. 33444

Continuation of Ser. No. 17,412, Mar. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,222, Jul. 20, 1977, Pat. No. 4,142,456. This application May 1, 1981, Ser. No. 259,667
Int. Cl.[4] F24F 7/00
U.S. Cl. 98—40.12 8 Claims

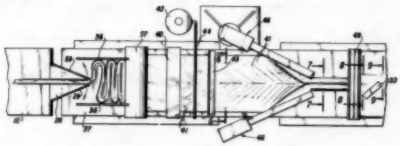


1. An air diffuser for an air outlet, said air diffuser comprising a plurality of regularly disposed stationary rigid diverging nozzles dividing the flow of air from said outlet into separate diverging air streams, said nozzles each having substantially parallel opposite stationary sidewalls and being substantially square in section, and said nozzles having longitudinal axes mutually disposed at a predetermined constant angle in the range of about 15° to 30°, wherein said nozzles are formed by a pair of substantially parallel flat baffle plates and by a plurality of stationary wedge members disposed between said baffle plates, each of said wedge members has a leading edge formed by a pair of flat walls converging at said predetermined constant angle in the range of about 15° to 30° and is arranged such that opposite walls of consecutive wedge members are substantially parallel and form with said baffle plates said nozzles having substantially square cross-section, and each of said nozzles has an outlet separated from the outlet of an adjacent nozzle by a distance which is at least one-half the width of each of said nozzles.

4,679,496
APPARATUS FOR PRODUCING LAMINATED PRODUCTS

William J. Simelunas, Glen Rock, and Nicholas R. Polifroni, Cliffside Park, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 18, 1984, Ser. No. 611,671
Int. Cl.[4] A23G 3/00
U.S. Cl. 99—450.2 20 Claims



1. Apparatus for producing a laminated sheet product having thin layers of a semifluid first material interleaved with thin layers of a semifluid second material, comprising:

longitudinally extending first conveyor means;

longitudinally extending second conveyor means, aligned with said first conveyor means and moving at a velocity slower than same;

means for continuously forming a first sheet of the first material on said first conveyor means;

means for folding said sheet from an edge thereof over itself to form a rope having a width substantially less than the width of said sheet;

means for transferring said rope from said first conveyor means to said second conveyor means in alternate first and second directions substantially transverse to said second conveyor means;

means for continuously forming a second sheet of the first material on said second conveyor means;

means for continuously depositing the second material on said second sheet to form a layered sheet of said first and second materials;

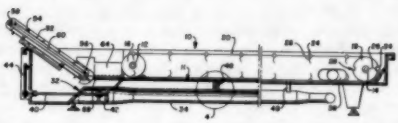
means for continuously rolling said layered sheet from the edges thereof inwardly to form a double roll extending longitudinally along said second conveyor means; and

means for flattening said roll into a laminated sheet product.

4,679,497
CHEESE HARDENING MACHINE FOR PASTA FILATA CHEESE

Stefano Tomatis, via Provinciale 141, 12010 San Lorenzo di Peveragno (Cuneo), Italy

Filed Sep. 18, 1985, Ser. No. 777,348
Claims priority, application Italy, Sep. 25, 1984, 67953 A/84
Int. Cl.[4] A01J 25/00
U.S. Cl. 99—455 8 Claims



1. A cheese hardening machine for pasta filata cheese such as ball-shaped mozzarella, comprising:

(a) an elongated vat having a loading end and a delivery end and a flat, substantially horizontal bottom, said vat being fillable with water to a predetermined level thereby to provide, in use, a filling of water for said machine;

(b) tube means connecting said delivery end of said vat to said loading end of said vat, said tube means extending outside the vat below said predetermined level as an outside circulation loop;

(c) a motor-driven axial turbine interposed in said tube means, said turbine being adapted to withdraw water from said vat at said delivery end, propel, during use, at least some of said withdrawn water, at a high speed from said delivery end to said loading end and to reintroduce thereby recirculated water therefrom into said vat at said loading end, whereby a highly tubulent flow of water is generated in said vat from said loading end to said delivery end;

(d) shovel means comprising a set of blades extending transversely to said vat near said vat bottom and extending upwardly short of said predetermined level, said shovel means being movable in the direction of net water flow in said vat towards said delivery end of said vat;

(e) loading means for loading cheese into said vat at said loading end of said vat; and

(f) extractor means for continuously extracting cheese from said vat at said delivery end of said vat.

4,679,498

INSTALLATION FOR PREPARING A CHOCOLATE PASTE

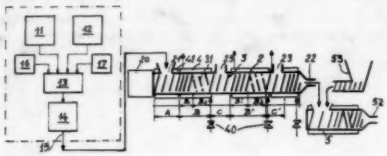
Henri Chaveron, Paris; Jean Pontillon, Meulan; Michel Billon, Unieux; Hervé Adenier, Compiegne, all of France, and Ahmed Kamoun, Sfax, South Africa, assignors to Clextral, Paris, France

Division of Ser. No. 731,622, Apr. 26, 1985. This application Jan. 30, 1986, Ser. No. 824,333

Claims priority, application France, Aug. 26, 1983, 83 13769

Int. Cl.[4] A23G 1/10

U.S. Cl. 99—483 7 Claims



1. Installation for continuously preparing a chocolate paste comprising means for grinding (**11**, **12**, **13**, **14**), mixing and refining ingredients comprising at least particles of cocoa and sugar, means for fluidification by dispersion of said particles of cocoa and sugar in a continuous fatty phase and means for degasifying, by evaporation of water and of undesirable volatile compounds, a portion of said installation being constituted by a screw conveyor comprising a long sleeve (**2**) surrounding at least two screws (**3**) with parallel axes, means (**20**) for driving said screws in rotation at an adjustable speed about their axes and means (**4**) for regulating the temperature of the material entrained in said screws, wherein said screw conveyor (**2**) constitutes means for dry-conching the refined paste placed, in a continuous production circuit, downstream of refining means (**14**) and upstream of means (**5**) for liquefaction by incorporation of additives whose nature and proportions correspond to a predetermined recipe, said screw conveyor (**2**) being fed continuously a predetermined flow rate of paste refined to the degree of particle size necessary for the finished product and comprising, upstream to downstream, a zone (A) of supply and preliminary kneading provided with means (**41**) for heating the paste and at least one treatment zone (B) provided with means (**31**) for rolling and shearing whose effectiveness increases progressively, and means (**4**) for regulating the temperature, each treatment zone (B) being followed by a degasifying zone (C), said liquefaction means being constituted by a final treatment zone (**50**) of said screw conveyor placed downstream of the last degasifying zone (C') and at the entrance of which said sleeve (**2**) is provided with at least one orifice (**28**) for the introduction of liquefaction additives.

4,679,499

APPARATUS FOR SIZING AND PEELING LONGATED CYLINDRICAL BODIES OF VEGETABLE MATTER

Joaquin Gutierrez-Rubio, Seville, Spain, assignor to Sociedad Anonima de Racionalizacion y Mecanizacion (Sadrym), Seville, Spain

Filed Jul. 11, 1985, Ser. No. 753,901

Claims priority, application Spain, Sep. 21, 1984, 536.171

Int. Cl.[4] A23N 7/04

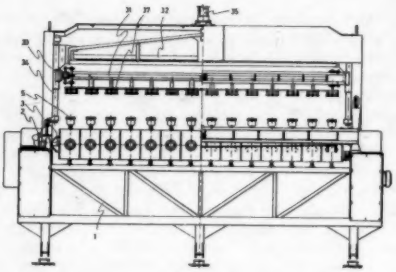
U.S. Cl. 99—591 9 Claims

1. Apparatus for sizing and peeling elongated, generally cylindrical bodies of vegetable matter such as spears of asparagus, comprising:

a drum mounted for stepwise rotation about a horizontal axis through a loading station, a peeling station and an unloading station which are disposed peripherally of the drum with substantially 90 degrees spacing between each said station respectively at a substantially horizontal position, a substantially vertical position and a substantially horizontal position;

a plurality of longitudinally extending rows of radially outwardly opening mouthpieces provided on said drum, each row extending substantially in alignment with said horizontal axis and arranged to be brought serially into each of said stations as said drum is rotated in a stepwise manner, each of said mouthpieces being adapted to telescopicaly receive an end portion of a respective cylindrical body of vegetable matter when that mouthpiece is in said loading station and to grip and maintain a grip on said end portion as said drum is rotated in a stepwise manner, until after the respective cylindrical body of vegetable matter has been peeled in said peeling station and has arrived at said unloading station;

said loading station being juxtaposed with said drum and including conveyor means arranged for individually serving each said mouthpiece in a respective row of said mouthpieces by accepting a respective generally cylindrical body of vegetable matter deposited thereon and guiding that body radially inwardly towards said drum until a



respective said end portion of that body is telescopically inserted thereby into the respective said mouthpiece;

said peeling station being juxtaposed with said drum and including cutting means arranged for individually serving each said mouthpiece in a respective row of said mouthpieces by engaging and mechanically cutting an outer peripheral layer from a main portion of the respective generally cylindrical body of vegetable matter gripped in each respective mouthpiece in the respective said row, excepting said end portion of such body; and

said unloading station being juxtaposed with said drum and including means for individually extracting each peeled, generally cylindrical body of vegetable matter from a respective said mouthpiece in a respective said row of said mouthpieces, as that mouthpiece releases its grip on the respective said end portion of the respective said body; and

a take-away conveyor means on which each said extracting means deposits each respective said peeled, generally cylindrical body of vegetable matter extracted from a respective said mouthpiece thereby.

4,679,500

PRINTER WITH PLURAL ENDLESS BANDS AND STOP MEANS THEREFOR

Heinrich Volk, Beerfelden-Gammelsbach, Fed. Rep. of Germany, assignor to Esselte Meto International GmbH, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,432

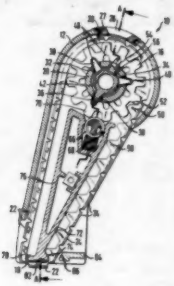
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427858

Int. Cl.[4] B41J 1/20; B41K 1/10

U.S. Cl. 101—111 4 Claims

1. Printing mechanism comprising a plurality of setting

wheels which are mounted rotatably about a common axis and with which endless printing bands are in a drive connection which carry printing types in a region of their length at the outer surface and indicating types in another region of their length at the outer surfaces and which are led about the setting wheels and about a deflection edge arranged spaced therefrom and which are adjustable by turning the setting wheels, the printing bands being provided with a plurality of teeth in said another region of their length at the inner surface thereof for engagement in corresponding recesses in the setting wheels, said mechanism further comprising a setting shaft adapted to be brought into a drive connection with each of the setting wheels, said setting shaft carrying an actuating knob, and said mechanism further comprising stop means for limiting the



turning angle of the setting wheels, said stop means comprising stop shoulders disposed in the path of movement of the tooth lying in front of the plurality of the teeth when regarded in the respective adjustment direction of the printing bands, characterized in that the stop shoulders are disposed directly adjacent the deflection edge and the height of at least the teeth lying in front of the plurality of the teeth in each adjustment direction of the printing bands is greater than the printing band deflection possible due to the elasticity of the printing band in the region of the stop shoulder, and a web is disposed at least in the region of the stop shoulder in the association with the outer surface of the printing bands, said web being spaced from the stop shoulder a distance which is smaller than the height of at least the tooth lying in front in each adjustment direction of the printing band plus the printing band thickness.

4,679,501

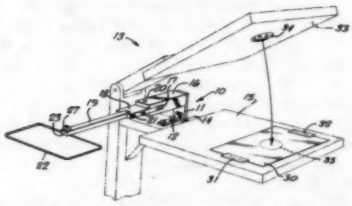
REGISTRATION DEVICE FOR USE IN SILK SCREEN PRINTING

Alan L. Hanosh, 4025 Bohannon Dr., Menlo Park, Calif. 94025

Filed Feb. 10, 1986, Ser. No. 827,641

Int. Cl.[4] B41F *15/00*; B41M *1/18*

U.S. Cl. 101—114 **5 Claims**



1. A registration device for use in silk screen printing of articles to facilitate the accurate positioning of the article to be printed, said registration device comprising:

a silk screen printing apparatus supported by a printer frame and including a platen supported by said printer frame;

a support arm affixed to said printer frame in a fixed position with respect to the platen of said silk screen printing apparatus;

a frame holding arm support block and frame holding arm assembly including a frame holding arm, said assembly being affixed to said support arm, said frame holding arm having a first end where it is attached to said frame holding arm support block and a second end, said support block horizontally, pivotally holding a frame holding arm in a manner to permit said frame holding arm to move in a generally horizontal plane, said frame holding arm having two sections pivoted together so that the frame means may move upwardly, said support block having stop means to position said frame holding arm in a specific home position;

frame means affixed to the free end of said frame holding arm, the frame means being movable to contact the platen of the silk screening apparatus when said frame holding arm is in its home position; and

a transparent sheet having the indicia to be printed on its upper surface affixed to said frame means whereby an object to be silk screened may be placed on said platen and moved so that the exact location to be printed may be moved under the indicia on the transparent sheet on the frame, and the frame and transparent sheet may then by swung out of the way and the object printed in the desired location.

4,679,502

REGISTER SYSTEM FOR IN-REGISTER ALIGNMENT OR ORIENTATION OF A FLEXIBLE PRINTING PLATE

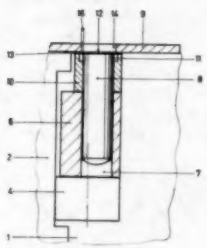
Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 392,803, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 59,024, Jul. 19, 1979, abandoned. This application Dec. 9, 1985, Ser. No. 807,193

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831921

Int. Cl.[4] B41F *27/06*

U.S. Cl. 101—415.1 **14 Claims**



1. Register system of in-register alignment of a flexible printing plate on a plate cylinder of a rotary printing machine comprising means defining at least two register punch-holes formed in the printing plate and register markings corresponding thereto formed in the plate cylinder, the printing plate having a lower surface facing towards the plate cylinder and the plate cylinder having a rotary axis, said register markings being at a radial distance from the axis of the plate cylinder at most equal to the radial distance of the lower surface of the printing plate therefrom, said register markings comprising respective surface areas slightly smaller than and geometrically similar to a cross-sectional area of said register punch-holes and having a appearance contrasting with the surroundings thereof, said means defining said register punch-holes

being respective edges of the printing plate and, in clamped condition of the printing plate on the printing cylinder, being spaced from and being adjustable in relation to the contours of said register markings in the printing cylinder, said printing plate remaining contact-free in relation to said register markings during adjustment of said means defining said register punch-holes in relation to the contours of said register markings.

4,679,503

DETONATOR SECURING DEVICE

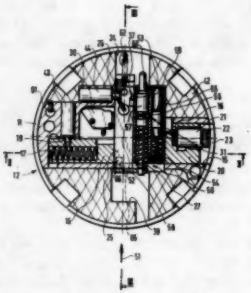
Werner Rüdenauer, Roth; Wilhelm Fürst, Buchberg, and Norbert Liebl, Ruckersdorf, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,333

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418759

Int. Cl.[4] F42C *15/40, 15/34*

U.S. Cl. 102—208 **7 Claims**



1. Safe and arm unit for an ignition device for a projectile, including a detonator latching slider, an impeller-generator extendable laterally on a carriage outwardly of the projectile; a slider guidance for guiding said impeller-generator laterally of the longitudinal axis of the projectile, a securing means for the detonator latching slider being releasable by the electrical energy of the impeller-generator; a blocking element projecting into the slider guidance as long as the projectile remains in an unlaunched condition; a locking pin extending into the slider guidance for the carriage of the impeller-generator as long as the projectile is not yet launched; and a tension spring engaging the latching slider in opposition to the armed position of the forward displacement of said slider.

4,679,504

HELICOPTER ROTOR FOULING

Richard H. Carpenter, Alexandria, Va., assignor to Commonwealth Technology Incorporated, Alexandria, Va.

Filed Dec. 3, 1984, Ser. No. 677,484

Int. Cl.[4] F42B *4/12*

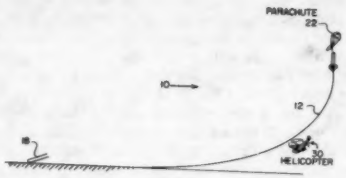
U.S. Cl. 102—348 **9 Claims**

6. An apparatus for fouling a rotor system of a helicopter positioned in a localized space comprising:

a carrier located initially at a launch point;

a propelling means for said carrier for propelling said carrier so as to overfly the localized space;

a long flexible line including a means for playing out said line located at the launch point, said line including a proximal end attached to said carrier and a distal end which trails on the ground;



a terminating means for terminating the playing out of said line by said carrier after overflying the localized space and before said distal end of said line leaves the ground.

4,679,505

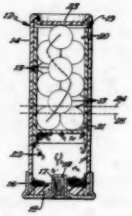
00 BUCKSHOT SHOTSHELL

Hugh B. Reed, Wayzata, Minn., assignor to Federal Cartridge Corporation, Minneapolis, Minn.

Filed Nov. 30, 1984, Ser. No. 676,588

Int. Cl.[4] F42B *7/06, 7/10*

U.S. Cl. 102—449 **22 Claims**



1. A 12 Gauge 00 lead buckshot shotshell comprising:

(a) a shotshell casing having elongated tubular sidewalls and having a basewad with a centrally disposed primer opening extending therethrough longitudinally of said casing;

(b) a shotshell primer disposed within said primer opening;

(c) a propellant superimposed with respect to said primer within said casing;

(d) obturator wad means superimposed upon and covering said propellant;

(e) a sleeve member disposed within said casing in superimposed relation to said wad means and having a constant internal diameter greater than 00 buckshot but less than 2.154 times the diameter of 00 lead buckshot;

(f) a plurality of 00 lead buckshot pellets superimposed upon each other within the sleeve member, each of said pellets intersecting a nesting zone with an adjacent pellet and having load-bearing points of contact relative to the adjacent pellets the total of which numbers greater than zero but less than six;

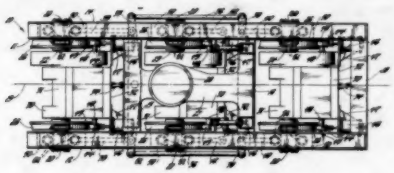
(g) closure means closing the end of said casing and holding said buckshot within said casing until the shotshell is fired; and

(h) the center of each of said pellets being located outside the nesting zones of said pellet

4,679,506
RAILWAY TRUCK WITH IMPROVED STEERING LINKAGE, DETACHABLE SUSPENSION AND TRACTION MOTOR MOUNTED BRAKE

David J. Goding, Palos Park, and Remigio R. Ramos, Bolingbrook, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1985, Ser. No. 800,321
Int. Cl.[4] B61C 9/50; B61F 5/38, 5/30
U.S. Cl. 105—136 15 Claims

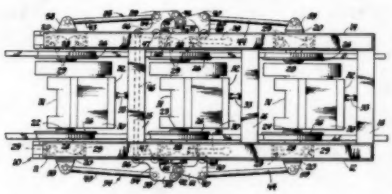


12. A combination in a powered steering railway truck of
a pair of longitudinally spaced rail engaging wheel and axle members each including a pair of wheels laterally connected by an axle,
frame means carried by said axles,
yieldable suspension means supporting the frame on the axles and permitting limited yawing of said wheel and axle members,
a traction motor drivingly connected with at least one of said axles, said motor having a housing supported along one side by axle bearings carried by its respective axle and restrained from rotation about said axle by torque means reacting against said frame, said motor housing moving together with said axle during yawing of the wheel and axle members, and
a tread brake including a wheel engagable shoe and actuating means including a force developing device connected with and operative to move said shoe into and out of engagement with said wheel to apply and release the brake, said actuating means being carried on said traction motor housing to establish fixed dimensional relations between the brake and its associated wheel and to completely separate the brake application forces from having any effect upon the axle steering forces.

4,679,507
THREE-AXLE RAILWAY TRUCK STEERING LINKAGE

Mostafa Rassaian, Lisle, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1985, Ser. No. 803,439
Int. Cl.[4] B61B 3/06, 5/38
U.S. Cl. 105—136 7 Claims

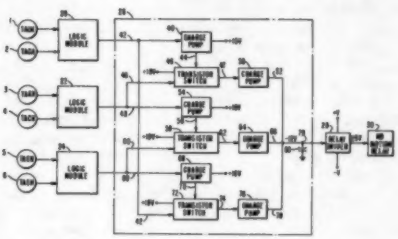


1. Steering and restraining mechanism in combination with a three-axle steering railway truck including a frame support by front, center and rear sequentially longitudinally spaced axles, each having a pair of flanged wheels secured near its opposite ends, and yieldable suspension means between the axles and the frame, and nominally urging the axles into centered positions for motion along straight paths but permitting limited yawing and lateral movement of said axles, said steering and restraining mechanism carrying all traction and braking forces between the axles and the frame, and comprising
restraining means establishing an essentially fixed longitudinal relation between the frame and said center axle and transmitting all its traction and braking forces to the frame but permitting relative vertical and lateral motion therebetween,
a pair of linkages, one on each side of the truck and interrelating the ends of the axles on its respective side, the linkages being interconnected laterally across the frame for equal and opposite motion, each linkage including
first and second levers operatively laterally engaging one end of the center axle and pivoted at points of the frame longitudinally spaced toward the front and rear axles, respectively, from said one end of the center axle,
a front traction rod longitudinally connecting a point of said first lever laterally outboard of its pivot with one end of the front axle, and
a rear traction rod longitudinally connecting a point of said second lever laterally outboard of its pivot with one end of the rear axle,
said front and rear traction rods exclusively carrying all traction and braking forces from their respective axles to the frame,
said levers, rods and points being related in a manner to require equal and opposite yawing movements of the front and rear axles to correspond with predetermined lateral movements of the center axles to provide substantially radial positioning of the axles during negotiation of a constant curve.

4,679,508
TRANSIT VEHICLE DOOR CONTROL APPARATUS

Mark T. Fruehan, West Mifflin; Jeffrey A. Fennig, Library, and Jayant K. Kapadia, Pleasant Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1986, Ser. No. 832,497
Int. Cl.[4] B60N 5/00
U.S. Cl. 105—341 5 Claims



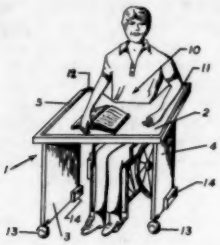
1. In door control apparatus for a vehicle having at least one door and a plurality of trucks each having two axles, the combination of:
first means for providing at least two speed signals for each of said trucks;
second means responsive to the two speed signals for each truck to provide a first output signal for each truck when each of the speed signals for said truck indicate a vehicle speed less than a predetermined speed condition.
third means responsive to the first output signal for a first truck and the first output signal for a second truck to provide a second output signal,
fourth means responsive to the first output signal for said second truck and the first output signal for a third truck to provide a third output signal, and
fifth means responsive to one of said second output signal and said third output signal to control the operation of said door.

4,679,509

WHEEL CHAIR TABLE SYSTEM

Samuel O. Sampson, Jr., 4732 Southshore Dr., Metairie, La. 70002

Filed Jun. 18, 1985, Ser. No. 745,923
Int. Cl.[4] A47B *39/00*
U.S. Cl. 108—27 **1 Claim**



1. A wheel chair table system, comprising:

a horizontal planar surface disposed generally above a pair of horizontally parallel arms of a wheelchair, said planar surface having a generally straight rear edge, a pair of generally parallel side edges extending laterally forward from the ends of said rear edge and separated by a distance generally wider than said arms of said wheelchair, and a front edge extending laterally between the forward ends of said side edges and generally parallel to said rear edge;

a notch in said front edge extending rearward into said planar surface, said notch having a straight rear edge portion disposed generally parallel to said rear edge and a pair of straight side edges extending angularly outward from said rear edge to define a cut out having a narrower rear portion and a wider front portion;

a pair of generally opposed planar side members extending laterally downward from a lower surface of said planar surface;

means for retaining said planar side members and said planar surface in a rigidified configuration;

a pair of opposed rollers formed by attaching a roller to a rear, lower portion of each of said side members to provide for movement of said planar surface, said opposed rollers further being disposed in a vertical plane generally parallel to said rear edge of said planar member to provide a means for rotating said planar surface to a tilted configuration with its front edge raised to a position higher than its rear edge;

a footing extending downward from a front, lower portion of each of said side members having a lower surface suitable for engaging a floor surface to prevent lateral motion thereon, said footings forming a pair of opposed footings for restraining lateral motion of said planar surface;

a handle attached to a portion of said front edge on both sides of said cut out for use by an invalid in a wheel chair to rotate and lift said planar surface about said opposed rollers upward from a first configuration in which said footing engages said floor surface and a configuration in which said cut out in part, surrounds a forward body portion of said invalid, to a second configuration in which said cut out rotates with said planar surface and moves upward along a frontal periphery of said invalid to allow said planar surface to rotate to its tilted configuration with its front edge in a higher position than its rear edge while remaining in a configuration in which said cut out in part, still surrounds a forward body portion of said invalid, to further allow a separation between said footing and said flooring so that said planar surface may be moved about by said invalid from a first location to a second location with said wheel chair; and

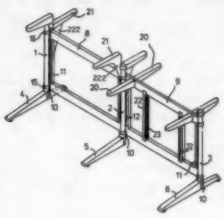
a lip extending around at least three edges of said planar surface, said lip having a portion extending upward from said rear edge and including generally parallel portions extending upward from said side edges to provide a means when said planar surface is in its tilted configuration for retaing articles on said planar surface.

4,679,510

OFFICE DESK, IN PARTICULAR FOR PERIPHERAL COMPUTER EQUIPMENT

Wolf Veyhl, and Erwin Kübler, both of Neuweiler, Fed. Rep. of Germany, assignors to Veyhl Produktion KG, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,050
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420648
Int. Cl.[4] B60C *17/00*
U.S. Cl. 108—152 **24 Claims**



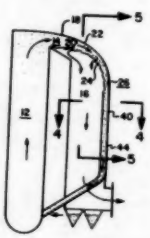
1. Office desk, in particular for peripheral computer equipment, comprising a table frame consisting of two side parts and a longitudinal beam connecting the two side parts, and a table top arranged between the side parts, characterized in that the side parts are formed by columns provided with feet, that the columns comprise connection elements which are positively engaged by matching connection elements provided on the longitudinal beam which is detachably connected with the columns, and that carrying arms for at least one table top are fastened on the longitudinal beam.

4,679,511

FLUIDIZED BED REACTOR HAVING INTEGRAL SOLIDS SEPARATOR

Myron L. Holmes, Simsbury, and Leo A. Smolensky, Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 858,138, Apr. 30, 1986, Pat. No. 4,640,201. This application Oct. 30, 1986, Ser. No. 925,770
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.[4] F23J *3/00*
U.S. Cl. 110—216 **7 Claims**



1. A fluidized bed reactor system for treatment of a particulate material in a fluidized state in a gas comprising:

a. a reactor enclosure defining a treatment chamber for

treating the particulate material in a fluidized bed in a fluidizing gas and having a gas outlet above said bed for passing the gas from the treatment chamber;

b. a gas duct disposed downstream of the reactor enclosure for venting the gas from the treatment chamber;

c. separator means for separating particulate solids carried over from the treatment chamber in the gas, said separator means comprising an arcuate duct having an inlet opening to the gas outlet of the reactor enclosure for receiving the gas from the treatment chamber and an outlet spaced from said inlet and interconnected to said inlet by a curvilinear floor, a curvilinear roof, and a pair of spaced sidewalls extending therebetween, a portion of the curvilinear floor being disposed atop the gas duct and having a plurality of openings therein providing a flow area through which a first portion of the gas passes from the arcuate duct of the separator means to the gas duct; and

d. solids collection means opening to the outlet of the arcuate duct of the separator means for receiving a second portion of the gas together with the particulate solids separated from the first portion of the gas passing through the floor portion of the arculate duct of the separator means.

4,679,512

METHOD OF AND APPARATUS FOR BURNING LIQUID AND/OR SOLID FUELS IN PULVERIZED FROM

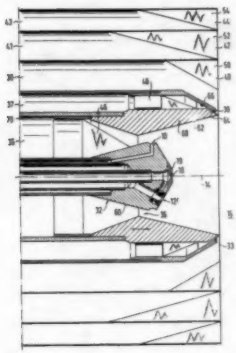
Kurt Skoog, Väddö , Sweden, assignor to Stubinen Utveckling AB, Väddö , Sweden

Filed Apr. 23, 1986, Ser. No. 855,134

Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518080

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **28 Claims**



1. A method of burning liquid fuels such as oil or the like and/or solid fuels, especially coal, peat or the like, in pulverized form, the latter either in dry condition or mixed with a carrier liquid such as water and/or oil to form an emulsion being introduced together with the liquid fuel into a combustion chamber while creating a recirculating flow profile, said flow profile being confined by a rotating outer flow of air, characterized in that the solid and liquid fuels are introduced into the combustion chamber separately and—in case of plural fuel inlets alternatingly—at a predetermined angular distance from each other along a circumference, especially along an imaginary circle.

4,679,513

THREAD-TENSIONING DEVICE FOR A BOBBIN HOUSING

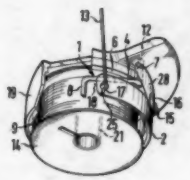
Erich Druffel, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,783

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1985, 3537391.1

Int. Cl.[4] D05B *57/14*

U.S. Cl. 112—229 **5 Claims**



1. A thread-tensioning device for a bobbin housing, the bobbin housing having an upper part and a lower part defining a space for a bobbin, and having jacket means for substantially surrounding a bobbin received therein, the thread-tensioning device comprising:

a thread-tensioning member having a first end supported on the housing, a second end of the thread-tensioning member comprising finger means for bearing upon a thread package accommodated on the bobbin.

4,679,514

PRESSER FOOT WITH SLIDABLE PLUNGER

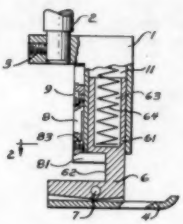
Konstantin Schwaab, Aichwald, Fed. Rep. of Germany, assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 18, 1986, Ser. No. 841,124

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511935

Int. Cl.[4] D05B *29/02*

U.S. Cl. 112—235 **21 Claims**



1. A presser foot, comprising:

a hub having a hollow guide;

a plunger having a guide member slidably received in the guide, said plunger having a lower portion carrying a sole which contacts the material being sewn;

means for biasing the guide member outwardly in the guide;

a guide part secured to the guide of the hub and having a lower leg directed toward the plunger; and

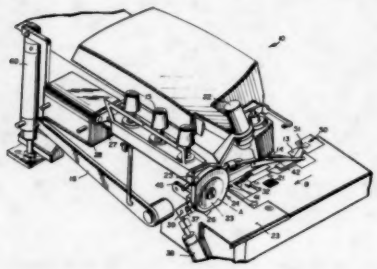
means cooperating between the leg and plunger to prevent rotation of the plunger, including means for adjusting the play between the hub guide and guide member.

4,679,515

PROCESS AND APPARATUS FOR STITCHING EXCESS THREAD CHAIN ON A SEWING MACHINE

J. Herbert Keeton, 747 Meader St., P.O. Box 296, Campbellsville, Ky. 42718

Filed May 23, 1986, Ser. No. 866,561
Int. Cl.[4] D05B *65/06*
U.S. Cl. 112—262.1 19 Claims



1. An attachment for a semi-automatic sewing machine, having a stitching needle for stitching a thread chain, a presser foot, and a power source, comprising:

means for automatically sensing the completion of stitching, by the semi-automatic sewing machine, of a first garment, by sensing a trailing portion of the first garment;

means for automatically engaging the first garment in response to said sensing and moving the first garment away from the stitching needle more quickly than the sewing machine stitches the thread chain, to pull excess thread chain extending past the trailing portion of the first garment relatively taut;

means for automatically severing the excess thread chain from the trailing portion of the first garment when the excess thread chain is relatively taut; and

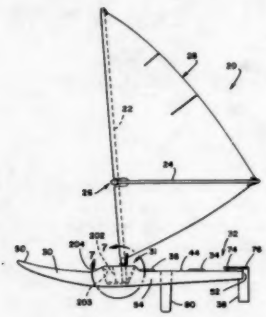
means for automatically positioning the excess thread chain with respect to a second garment so that the excess thread chain is stitched to the second garment by the sewing machine.

4,679,516

SAILBOARD ASSEMBLY HAVING A LIMITED DIPLACEMENT MAST

Terry V. Friesen, 636 Santana Rd., Novato, Calif. 94947-1531

Continuation-in-part of Ser. No. 656,707, Oct. 1, 1984, abandoned. This application Mar. 7, 1986, Ser. No. 837,606
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39 7 Claims



1. In a wind-propelled sailboard assembly including a board-like body on which a sailor may stand, a mast movably mounted to said body for angular displacement about an enlarged end thereof, manually engageable boom means carried by said mast and extending away therefrom, sail means mounted to said mast and coupled to said boom means, and mounting means removably mounting said mast to said body and including retainer means engaging said enlarged end of said mast and mounting said enlarged end for limited angular displacement of said mast about a normal orientation to said body, said mounting means further including a rigid collar mounted to said body in spaced apart generally concentric relation to said mast, said collar having a height dimension along said mast proximate said enlarged end, and a resilient member positioned between said mast and said collar and supporting said mast in an upright orientation with respect to said body when said boom means is released by said sailor and said mast moves to a released position, and said mounting means permitting sufficient manual angular displacement of said mast relative to said body by manipulation of said boom means by said sailor to enable balancing of the helm of said sailboard by tilting of said mast, wherein the improvement in said sailboard assembly comprises:

said resiliently displaceable member substantially filling the volume between said mast and said collar over said height of said collar and biasing said mast toward said released position upon any angular displacement of said mast from said released position in any direction toward said collar; and

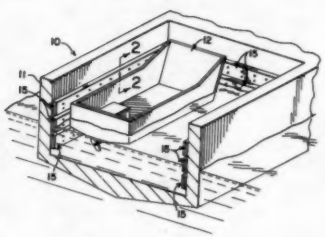
said retainer means being provided by a member mounted to said body and having an opening therein dimensioned for and slidably receiving said enlarged end of said mast therethrough.

4,679,517

FENDER PROTECTIVE STRUCTURES

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1986, Ser. No. 844,638
Int. Cl.[4] B63C *1/02*
U.S. Cl. 114—45 13 Claims

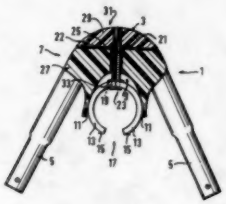


1. In a fender system for inside the hull of a ship comprising an elongated longitudinally extending fender, said fender having a first layer of ultra-high molecular weight material, a second resilient layer bonded to said first layer, said second layer having a plurality of openings in laterally spaced and longitudinally spaced relationship, a third layer of rigid non-resilient material bonded to said second layer, said third layer having a plurality of openings in laterally and longitudinally spaced alignment with said openings in said second layer, vent holes in said fender that communicate said aligned openings with the interior of said hull for venting fluids, and means for attaching said third layer to said hull of said ship.

4,679,518
FORKED THILL HEAD ATTACHMENT

Dieter Frank, Stangergasse 8, D-8242 Bischofswiesen, Fed. Rep. of Germany

Filed May 14, 1986, Ser. No. 863,032
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517740
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—98 13 Claims

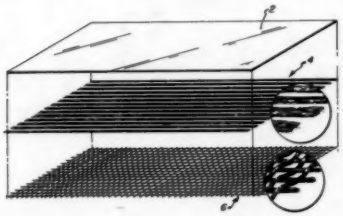


1. A forked thill head attachment for installing a forked thill to a mast of a rigging, with a V-shaped forked thill head, clamping jaws for gripping about the mast and forming a rearward vertical gap, said clamping jaws being constructed as a separate component from the forked thill head for detachable mounting to the mast together with a forward lying adjustment section of the forked thill head by a longitudinally alterable screw contrivance provided in the forked thill head in the region of the vertical longitudinal plane of symmetry of the clamping jaws, rotation of the adjustment section displacing the clamping jaws in the forward direction and pressing them toward one another, characterized in that said screw contrivance includes a longitudinal bolt running through the forked thill head in the longitudinal direction and joining the clamping jaws with respect to said adjustment section, said bolt being threaded such that rotating said screw contrivance presses said adjustment section and the clamping jaws toward one another, with said jaws contacting forwardly tapered inner contacting surfaces of an accommodating space of the forked thill head, said clamping jaws pivoted over a tilting axis lying perpendicularly to the vertical longitudinal plane of symmetry of the forked thill, wherein said clamping jaws are provided, substantially in the vertical plane of longitudinal symmetry, with a boring that is penetrated by the longitudinal bolt, with the clamping jaws being held by a bolt head integral with said bolt and having a larger diameter as compared to the inner diameter of the boring in the clamping jaws.

4,679,519
LAMINATED CLOTH CONSTRUCTION

James C. Linville, 2 Golden Ct., Rowayton, Conn. 06853

Filed Nov. 26, 1984, Ser. No. 674,764
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—103 13 Claims

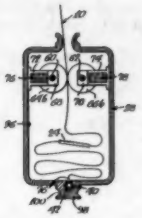


1. A sailcloth comprising at least three coextensive layers bonded together at their interfaces by a synthetic adhesive resin wherein one outer layer is a film of dimensionally stable synthetic polyester resin, the second outer layer is selected from the group consisting of a warp-knit fabric, a scrim fabric, taffeta and a film of dimensionally stable synthetic polyester resin, and wherein there are one or more inner layers one of which comprises a weft-free warp of strands of a stretch resistant polymer having a denier in the range of about 20 to about 1000.

4,679,520
MAINSAIL REEFING AND FURLING DEVICE AND METHOD

Olaf T. Harken, 1251 Wisconsin Ave., Pewaukee, Wis. 53072

Filed Jun. 10, 1985, Ser. No. 742,917
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—104 22 Claims

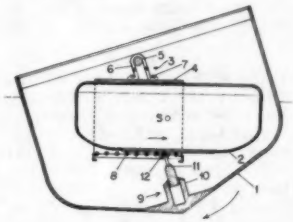


1. A device for furling a mainsail supported between a mast and a boom, said device comprising an opening for said sail along the top of the boom, a cavity within the boom for receiving the furled portion of the sail, and tractive means in frictional engagement with opposite sides of the sail along said boom for pulling said sail through said opening and into said cavity.

4,679,521
SHIP WITH STABILIZING DEVICE

Kemal Butka, 372 Central Park West, New York, N.Y. 10025

Filed Oct. 25, 1985, Ser. No. 792,831
Int. Cl.[4] B63B *39/02, 39/06*
U.S. Cl. 114—124 7 Claims



1. A ship comprising a hull having an inner hollow and a longitudinal axis; a body located in said inner hollow of said hull and movable in a direction substantially transverse to said longitudinal axis so that when said hull turns about said longitudinal axis in a first lateral direction under the action of waves, wind and the like said body urges to turn said hull back in a second lateral direction which is opposite to said first lateral direction so as to stabilize the ship; and guiding means arranged in said inner hollow of said hull and formed so that when said hull is turned about said longitudinal axis in said first lateral direction, said body is turned in said second lateral direction so as to stabilize the ship, said guiding means includ-

ing a supporting element arranged for supporting said body and mounted turnably about an axis extending substantially parallel to said longitudinal axis, and a guiding element arranged to guide said body in said supporting element, said supporting element being formed as a sleeve having an inner opening in which said body is slidingly located, said guiding element including a holding member connected with said body and movable in a substantially upright direction while being restrained from movement in a direction transverse to said lateral directions.

4,679,522

FLOAT DEVICE FOR SMALL SIZE BOAT

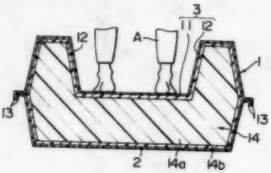
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 686,678, Dec. 27, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 878,505

Claims priority, application Japan, Dec. 28, 1983, 58-202323

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—357 **2 Claims**



1. A small size boat comprising a boat body made of hard material having an inside surface defining a cavity and a float which has been inserted in said cavity, said float having a central portion of buoyant hard foamed plastic of high density which comprises a larger portion of said float and has a shape substantially geometrically similar to, but smaller than, the cavity, and an outer portion of buoyant soft foamed plastic of low density which forms an outer layer around said central portion and comprises a smaller portion of said float, said outer layer being formed such that said central portion and said outer layer, together, have a shape substantially geometrically similar to, but larger than, the cavity when said outer layer is not compressed so that, when said float is confined within the cavity, said soft outer layer is compressed within the cavity and conforms with the inside surface of the body of the boat.

4,679,523

FLAG HAVING A SUPPORT PEDESTAL

Francisco O. Orero, and Augusto M. Garcia, both of Avda. Blasco Ibánez, 75-Paterna (Valencia), Spain

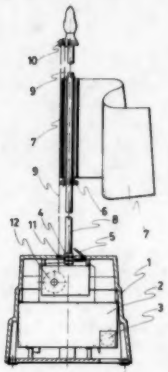
Filed Jul. 31, 1985, Ser. No. 761,088

Claims priority, application Spain, Nov. 28, 1984, 282991

Int. Cl.[4] G09F *17/00*

U.S. Cl. 116—173 **1 Claim**

1. A flag assembly comprising a pedestal frame (1) defining a space therein and having an upper rope receiving opening (11), a staff (8) connected to said frame and extending upwardly therefrom, said staff having a conductive base (4) adjacent said frame, a flexible conductive flap (5) connected to said frame and having a free end extending upwardly from said frame near said base, a miniature battery operated phonograph recorder (2) in said pedestal frame and having a pair of contacts which are closable with each other to activate said recorder, one of said contacts being electrically connected to said flap and the other of said contacts being electrically connected to said base so that said recorder is activated when said flap is engaged with said base, a pulley (10) rotatably mounted near a top end of said staff, a shuttle (6) having a sleeve telescopically slidable over said staff for upward and downward movement along said staff, said shuttle having a lower flange which is engageable against said flap to move said flap against said base when said shuttle is near a bottom of said staff to activate said recorder, a rope having one end connected to said shuttle and being entrained over said pulley, said rope having an opposite end extending through said opening (11) in said frame and into said frame, a spring-loaded winding spool (12) rotatably mounted in said frame and connected to said opposite



end of said rope, said opposite end of said rope being windable on said spool for raising said shuttle and unwindable from said spool for lowering said shuttle and loading said spring-loaded winding spool, said spool being rotatable by a spring when said shuttle is in its lowered position to rotate said spool to raise said shuttle, and a flag (7) having a portion engaged around said sleeve of said shuttle for being raised and lowered with said shuttle.

4,679,524

ARRANGEMENT FOR WEB COATING

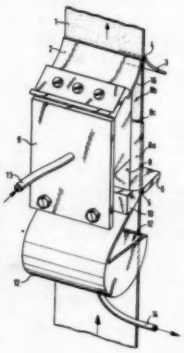
Dan Eklund, Viherlaaksontie, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Continuation of Ser. No. 537,734, Sep. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 307,868, Oct. 2, 1981, abandoned. This application Apr. 2, 1985, Ser. No. 718,826

Claims priority, application Finland, Oct. 8, 1980, 803184; May 5, 1983, 831672

Int. Cl.[4] B05C *11/04, 3/15, 3/18*

U.S. Cl. 118—122 **17 Claims**



1. Apparatus for non-pressurized coating a vertically up-

wardly travelling web moving at a given speed comprising, in combination:

a vertical coating chamber open to atmospheric pressure and free of any seal against atmospheric pressure and provided with means for substantially closing said coating chamber to use said coating chamber as a substantially closed case while being under said atmospheric pressure and being defined by said web, a pair of side walls, a back wall spaced from said web, and a flexible blade applied against said web, said side walls of said coating chamber being vertically adjustable thereby providing said means for said closed case;

a back-up rotating roll at the opposite side of said web and forming a coating nip together with said flexible blade, through which nip said web passes above said coating chamber;

a horizontally oriented slot at the bottom of said coating chamber forming a web entrance to said coating chamber such that the web moves in a substantially vertical direction upwardly through said horizontal slot and enters said slot in a substantially vertical direction;

said slot comprising rotatable screw means forming a slot width regulator for an infinitely regulator adjustment of the width of said slot, said slot width being regulated up to 5 cm, said screw means increasing or decreasing said width of said slot upon rotating said screw means;

means for supplying a coating substance of a given viscosity to said coating chamber;

the coating substance supply to said coating chamber and the width of said slot being so adapted to said speed of said web and said viscosity of said coating substance, that only a small amount of or substantially none of said coating substance flows vertically downwardly in a direction opposite to the direction of said upwardly travelling web through said slot during normal operation of said apparatus;

said side walls including an upper edge forming overflow means determining the level of said coating substance above said slot, and said upper edge of said side walls being below said blade; and

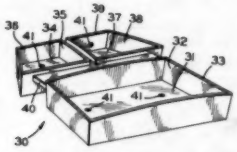
a collecting tank below said slot and separate from said coating chamber and open against said web mounted below said horizontally oriented slot to collect therein the coating substance which flows over said vertically adjustable side walls.

4,679,525

ARTICLE SUPPORTING FIXTURE

Edward W. Curtze, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Mar. 27, 1986, Ser. No. 844,577
Int. Cl.[4] B05C *13/00, 13/02*
U.S. Cl. 118—500 **17 Claims**



1. A fixture for supporting a window assembly, the window assembly including at least one glass sheet having a predetermined portion thereof encapsulated by a gasket, the glass sheet and the gasket each having inner and outer surfaces, the fixture comprising:

a floor;

an upstanding wall extending from said floor and having an upper edge defining a window assembly supporting surface, said wall having a flange formed at said upper edge to define a window assembly supporting surface; and

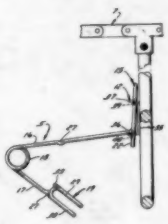
at least one reference means formed in the fixture.

4,679,526

WORKPIECE HOLDER FOR COATING PROCESSES

Jerome J. Dziedzic, Greenfield, Wis., assignor to Flur Wire & Metal Inc., Oak Creek, Wis.

Filed Jul. 31, 1986, Ser. No. 891,163
Int. Cl.[4] B05C *13/02*
U.S. Cl. 118—503 **5 Claims**



1. A workpiece holder which is detachably securable to a carrier and to which a workpiece to be coated is quickly and readily removably securable for transport by the carrier along a path that carries the workpiece through a coating station, said workpiece holder comprising:

a single piece of substantially stiff but springy wire having a pair of opposite ends, characterized in that:

A. a medial portion of said piece of wire is bent to define a pair of clamping arms connected by a spring coil,

(1) said clamping arms and spring coil being substantially contained in a single plane,

(2) each of said clamping arms having a front end adjacent to said spring coil and a rear end spaced rearwardly from the spring coil and spaced from the rear end of the other clamping arm, and

(3) each of said clamping arms having an undulation intermediate its said ends, said undulations defining opposing concavities in which opposite edge portions of a workpiece are receivable for confinement of the workpiece under clamping bias imposed upon the clamping arms by the spring coil;

B. one end portion of said piece of wire is bent to define a loop connected to one of said clamping arms at the rear end thereof and substantially all portions of which are coplanar, said loop providing for attachment of the workpiece holder to a carrier with said one clamping arm projecting in a predetermined direction from the carrier; and

C. the other end portion of said piece of wire is bent to define a pair of stabilizing wings each of which has an inner end and an outer end, the inner end of each stabilizing wing being adjacent to the rear end of the other of said clamping arms and the outer ends of the stabilizing wings being spaced to opposite sides of said plane and in forwardly offset relation to said rear end of said other clamping arm for engagement against rearwardly facing surface portions of a workpiece confined by said clamping arms,

(1) one of said stabilizing wings being substantially U-shaped with a bight portion at its outer end and a pair of elongated legs which are connected by said bight portion, one of said legs being connected at its inner end to the rear end of said other clamping arm, and

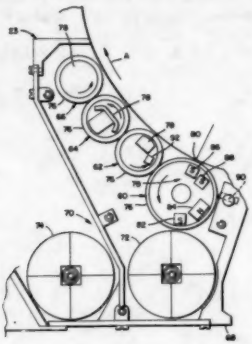
(2) the other of said stabilizing wings being connected at its inner end to the inner end of the other of said legs.

4,679,527

MAGNETIC BRUSH DEVELOPER

Phillip Chang, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1985, Ser. No. 813,783
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—658 **15 Claims**



1. Magnetic brush development apparatus including a housing, a magnetic brush roll mounted in said housing and adapted to be arranged in closely spaced relation to a photoconductor surface to define a nip therebetween, said roll comprising a cylinder surrounding a magnet assembly, a developer supply source arranged to supply developer mix to said magnetic brush roll, for causing relative rotary movement between said cylinder and its associated magnet assembly to cause developer mix to be carried from said supply source to be brushed on to said photoconductor surface in a development zone at the nip between said magnetic brush roll and said photoconductor surface, and a mix barrier for limiting the flow of developer mix from said supply source to said photoconductor surface, said magnetic assembly including:

a development magnet positioned in use in the development zone at the nip between said magnetic brush roll and said photoconductor surface, at least one transport magnet for transporting said developer mix from said developer supply source to said nip, and

a pre-nip magnet, having the same polarity as said development magnet, arranged ahead of the development zone between said development magnet and said at least one transport magnet, adjacent said development magnet, and so spaced from the transport magnet as to create a tangential field therebetween, said mix barrier being arranged between said transport magnet and said pre-nip magnet.

4,679,528

HEATING BOILER HAVING A VERTICAL BURNER TUBE

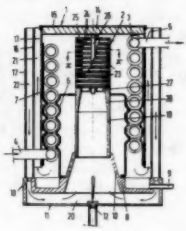
Peter Krans, Ugchelen, and Hermanus J. Meuleman, Apeldoorn, both of Netherlands, assignors to Remeha Fabrieken B.V., Apeldoorn, Netherlands

Continuation of Ser. No. 672,625, Nov. 19, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 834,156
Claims priority, application Netherlands, Nov. 24, 1983, 8304041
Int. Cl.[4] F22B *21/00, 9/02*
U.S. Cl. 122—367 C **5 Claims**

1. A heating boiler having a vertical axis and including, arranged concentrically with said axis, a completely premixing gas burner tube having a lower circumferentially closed premixing portion, with an upper end and a lower end, and an upper portion provided with a plurality of burner ports extending through the tube wall with inlets on the inside circumferential surface of the tube and outlets on the outside circumferential surface of the tube, the outside circumferential surface serving as a flame supporting surface; means for delivering a mixture of gaseous fuel and sufficient combustion air to burn the fuel completely to the lower portion of the burner tube; a helical water tube surrounding the burner tube; an enclosure surrounding the water tube and having a closed upper end; a flue gas discharge jacket surrounding and radially spaced from the enclosure; an annular bottom closure member mounted underneath the helical water tube and sealingly connected to both the flue gas discharge jacket and the lower portion of the burner tube; and means for guiding combusted fuel and air from the burner ports to the space between the enclosure and the flue gas discharge jacket, wherein the improvement comprises:

the lower circumferentially closed premixing portion having a length and a diameter such that complete premixing of fuel and combustion air is assured;

the upper portion of the burner tube being an assembly of stacked alternately flat and radially corrugated annular discs forming said plurality of burner ports such that the inlet areas of said ports are smaller than the outlet areas,



the discs having substantially equal inner and outer diameters, and the upper portion of the burner tube further including means for holding the stacked discs together and for attaching the stacked discs to the lower portion of the burner tube;

the annular bottom closure member comprising a condensate trough having a drain outlet;

a fuel nozzle mounted below said annular bottom closure member;

the connection between the annular bottom closure member and the lower portion of the burner tube comprising an upwardly extending passage coaxial with the vertical axis and tapering inwardly toward the lower end of the lower portion of the burner tube; and the interior surface of the burner tube tapers inwardly toward the upper end of the lower portion, and wherein the means for holding the stacked disc together comprises a flat plate placed on top of the stack of discs, a cross piece disposed in the tapered region of the lower portion of the burner tube, the cross piece having angles ends which matingly fit against the tapered interior surface of the burner tube, and a tension bolt connecting the flat plate to the cross piece.

4,679,529

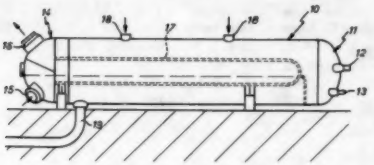
STEAM GENERATOR FEED WATER HEATER

Gérard Mancel, Houilles, France, assignor to Electricite de France Service National, Paris, France

Filed Apr. 21, 1986, Ser. No. 853,951
Claims priority, application France, Apr. 24, 1985, 85 06219
Int. Cl.[4] F22D *1/30, 1/34*
U.S. Cl. 122—441 **7 Claims**

1. Steam generator feed water heater comprising a pressurized enclosure, a heat exchanger through which the feed water is caused to flow, at least one horizontal condensate inlet tube, at least one condensate outlet tube at a low point on said enclosure, and a double screen device associated with said at least

one condensate inlet tube and comprising an inner screen with a cylindrical sidewall and, surrounding said inner screen an outer screen having one end linked to said inner screen, a bottom wall common to both screens constituting an impact wall facing said inner screen, and passage areas in which there



are provided perforations in said screens not facing each other over most of the perimeter of their transverse cross-sections, said outer screen comprising a barrel that is perforated except in a stop area extending over a major part of its perimeter facing the passage area of said inner screen.

4,679,530

COOLING SYSTEM FOR AN AUTOMOBILE ENGINE

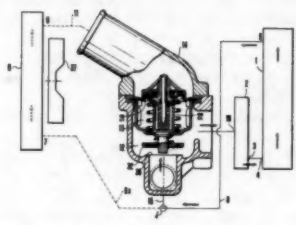
Yoshikazu Kuze, 31-3, Higashimagome 1-chome, Ohta-ku, Tokyo, Japan

Filed Feb. 18, 1986, Ser. No. 830,093

Claims priority, application Japan, Feb. 19, 1985, 60-029388; Apr. 26, 1985, 60-088771; Apr. 26, 1985, 60-088772

Int. Cl.[4] F01P *7/16*

U.S. Cl. 123—41.1 **3 Claims**



1. A cooling system for an automobile engine having a water jacket, a radiator, a water pump, and a thermostat housing, comprising:

a first passage communicating an upper outlet of the water jacket with an inlet of the radiator provided at a lower portion thereof;

a second passage communicating an upper outlet of the radiator with an inlet of the water pump and having the thermostat housing at the upstream of the pump;

an outlet of the pump being communicated with a lower inlet of the water jacket;

a bypass connected between the first passage and the thermostat housing;

a thermostat comprising a thermo-sensitive device, a first valve and a second valve disposed in the thermostat housing, both the valves being operatively connected to the thermo-sensitive device, so that the first valve closes the second passage and the second valve opens the bypass;

the thermo-sensitive device being disposed in the bypass and the first and second valves being operated by the operation of the thermo-sensitive device.

4,679,531

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

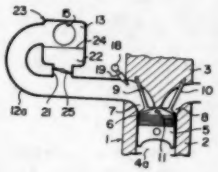
Mitsuo Hitomi; Fumio Hinatase, and Yasuhiro Yuzuriha, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Nov. 6, 1985, Ser. No. 795,443

Claims priority, application Japan, Nov. 8, 1984, 59-235440; Dec. 29, 1984, 59-275487

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—52 MB **32 Claims**



1. An intake system for an internal combustion engine having a plurality of cylinders arranged along a first direction comprising:

an intake passage including a common passage portion opening toward atmosphere and having a downstream end, a surge tank extending along said first direction and connected to the downstream end of the common passage portion, and a plurality of discrete passage portions, each of which branches from the surge tank via an opening and is respectively connected to one of the cylinders, the respective openings of the discrete passage portions being aligned in said first direction;

at least one interconnecting passage provided to connect each of the discrete passage portions only with each other at a portion of each of the discrete passage portions downstream of the surge tank, said at least one interconnecting passage comprising a main interconnecting portion and discrete connecting portions connected at opposit ends to the main interconnecting portion and the respective discrete passage portions said main interconnecting portion being disposed adjacent to and below the surge tank;

an on-off valve disposed at each junction of the at least one interconnecting passage with the discrete passage portions and in the respective discrete connecting portion, said on-off valve being adapted to move between an open position and a closing position, said junction being substantially spaced from where the discrete passage portions connect with the respectie cylinders; and

an actuator which moves the on-off valves to the open positon as the engine speed increases at least during heavy load operation of the engine.

4,679,532

VALVE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Kazuo Aoi, Hamamatsu, and Naoki Tsuchida, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 12, 1985, Ser. No. 764,880

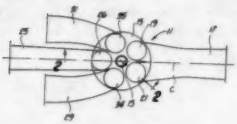
Claims priority, application Japan, Aug. 15, 1984, 59-169375

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.22 **7 Claims**

1. In a valve arrangement for an internal combustion engine having a combustion chamber having a peripheral edge in plan view defining a closed curve, at least three intake valves serving said chamber, and at least two exhaust valves serving said chamber, the improvement comprising said valves being located so that their outer edges all lie adjacent said closed curve

so that said valves lie on a closed curve spaced inwardly from the peripheral edge of said combustion chamber in plan view,



no two of said exhaust valves being adjacent to each other around the closed curve upon which they lie.

4,679,533

PNEUMATIC STARTER

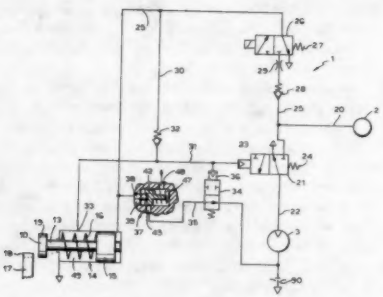
Juergen Klie, and Hans-Wilhelm Weiss, both of Sprockhoevel, Fed. Rep. of Germany, assignors to G. Duesterloh GmbH, Sprockhoevel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,128, Aug. 23, 1984, abandoned. This application Feb. 18, 1986, Ser. No. 830,683

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330314

Int. Cl.[4] F02N *7/08*

U.S. Cl. 123—179 F **18 Claims**



1. In a pneumatic starter arrangement for use in connection with an internal combustion engine having a flywheel gear (17), comprising a pneumatic starter motor (3), an axially retrievable pinion (19) engageable with the flywheel gear, a pneumatic actuator (14) having a spring-biased piston (15) coupled to the pinion (19) for imparting the axial motion to the latter, a supply branch conduit (25) connecting a pressure supply source (2) to the actuator, a main supply conduit (22) connecting the pressure supply source to the starter motor, a main control valve (21) provided in the main supply conduit, a pilot valve (26) provided in the supply branch conduit between the pressure supply source and the actuator (14), means for controlling the position of the main control valve in response to the position of the piston of the pneumatic actuator, and a bypass conduit (35) connecting the starter motor to the supply branch conduit, the improvement comprising a relief valve (37) positioned in said bypass conduit and being designed such that its opening pressure is substantially greater than its closing pressure, and resistance-to-flow means (90) connected to said bypass conduit and arranged at an exhaust side of the starter motor, the ratio of combined air volumes of all pressure air conduits between the starter motor, the main control valve and the relief valve and between the starter motor and the resistance-means and the pressure-relief valve on the one side, and the pilot valve, the pneumatic acutator and the relief valve, on the other side, being between 3:1 and 15:1.

4,679,534

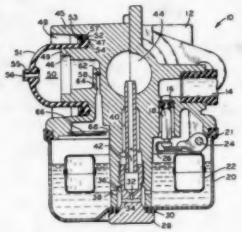
PRIMER FOR FLOAT-TYPE CARBURETORS

Thomas G. Guntly, Hartford, and Curtis L. Schultz, Grafton, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 25, 1986, Ser. No. 833,350

Int. Cl.[4] F02M *1/16*

U.S. Cl. 123—187.5 R **11 Claims**



1. A primer for a carburetor, said carburetor adapted to provide a combustible fuel/air mixture to a combustion engine and including a carburetor body, a fuel/air mixture passage, a fuel supply bowl, and a fuel nozzle means for conducting fuel from the fuel supply bowl to the mixture passage, said primer comprising:

a primer chamber in said carburetor body;

an operator actuable displacing means for abruptly displacing a discrete volume of air from said chamber, said displacing means including a vent aperture for admitting air from outside said carburetor body into said chamber;

a generally downwardly sloping surface in said chamber, said surface being oriented parallel to the direction of flow of air through said vent aperture, said surface including a priming aperture therein, said priming aperture being located intermediate the upper and bottom surfaces of said primer chamber;

a generally vertical surface in said chamber perpendicularly adjoining surface in said chamber perpendicularly adjoining said downwardly sloping surface; and

a passageway extending from said priming aperture into said fuel supply bowl.

4,679,535

DUAL ACTION GENEVA CAM AND ROTARY INTERNAL COMBUSTION ENGINE AND PUMP UTILIZING SAME

Richard S. Stadden, P.O. Box 6053, Atascadero, Calif. 93423

Filed Jan. 6, 1986, Ser. No. 816,356

Int. Cl.[4] F02B *53/00*

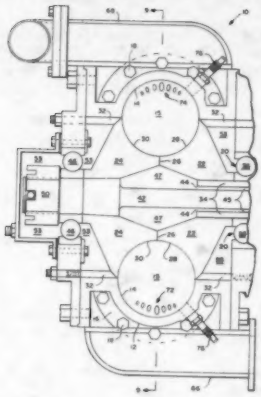
U.S. Cl. 123—245 **13 Claims**

1. A dual action geneva cam comprising:

(a) a driven member rigidly connected to a drive shaft, said driven member comprising two diametrically opposed driving pins, two diametrically opposed locking cams and two diametrically opposed relief sections, and

(b) at least first and second driving members rotatively disposed in adjacent quadrants about said driven member, each of said driving members comprising four cam-locking surfaces to engage and disengage said locking cams of said driven member and four slots to engage and disen-

gage said driving pins of said driven member whereby said driven member continuously rotates when alternatively



said first driving member is held stationary while said second driving member rotates.

4,679,536

ENGINE COMBUSTION CONDITION DETECTING SYSTEM AND METHOD

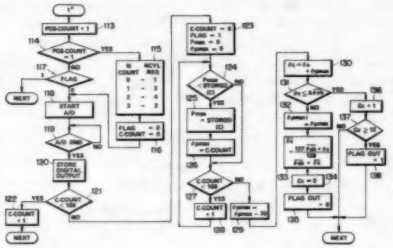
Tatsuo Morita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 30, 1985, Ser. No. 781,665

Claims priority, application Japan, Nov. 28, 1984, 59-249468

Int. Cl.[4] F02P *5/04*

U.S. Cl. 123—425 **12 Claims**



1. A system for an engine including a combustion chamber in which combustion is induced periodically by generating a spark, the system comprising:

(a) means for sensing pressure within the combustion chamber;

(b) means for detecting a timing at which the sensed pressure peaks;

(c) means for measuring an interval between an occurrence of a spark generation and the timing of the pressure peak;

(d) a memory;

(e) means for, in accordance with a length of the presently measured interval, selectively storing the presently detected timing of the peak pressure in the memory in place of data held previously in the memory or ignoring the presently detected timing of the pressure peak so as to allow the memory to continue to hold the previously detected timing of the pressure peak, comprising:

(1) means for deriving a mean value of the periodically measured intervals;

(2) means for comparing the presently measured interval to a reference value which is related to the mean value of the intervals;

(3) means for, when the presently measured interval is greater than the reference value, storing the presently detected timing of the pressure peak in the memory; and

(4) means for, when the presently measured interval is not greater than the reference value, ignoring the presently detected timing of the pressure peak;

(f) means for outputting a signal representing the detected timing currently held in the memory.

4,679,537

DAMPING DEVICE

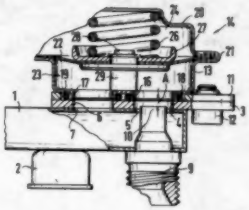
Siegfried Fehrenbach, Markgröningen; Kurt Herbst, Burgstetten; Wolfgang Schulz, Bietigheim-Bissingen, and Eberhard Utz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,568

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446324

Int. Cl.[4] F16L *55/04*

U.S. Cl. 123—447 **13 Claims**



1. A damping device comprising a damper element, a rigid fuel distributor line which distributes fuel to fuel injection valves of a fuel injection system for internal combustion engines, said damper element disposed on said rigid fuel distributor line and comprises at least one damper diaphragm fastened in a damper housing, said damper diaphragm further adapted to define a fuel chamber in said damper housing below said diaphragm and a damping chamber above said damper diaphragm, at least two flow openings extending from said fuel chamber to said fuel distributor line, a flow tube extending into said fuel distributor line in spaced relation with at least one flow opening in axial alignment therewith, said flow tube communicates with a fuel supply line connected to supply an outlet of a fuel feed pump and with said fuelchamber of said damper element via said at least one flow opening for supplying fuel to said rigid fuel distributor line.

4,679,538

DUAL FUEL ENGINES

Joseph S. Foster, West Vancouver, Canada, assignor to Pro-Staff Fuels Ltd., West Vancouver, Canada

Filed Dec. 1, 1986, Ser. No. 936,712

Int. Cl.[4] F02M *21/02*

U.S. Cl. 123—525 **4 Claims**

1. An improved gas injection system for uniflow dual fuel engines having a plurality of cylinders, a piston in each cylinder, inlet ports arranged around each cylinder to be uncovered by downward movement of the piston in the cylinder, comprising:

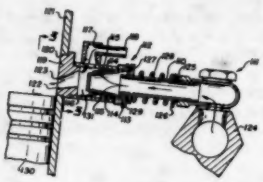
a seal located in one inlet port;

a reed valve assembly connected to said inlet port via said seal;

an inlet pipe connected to said reed valve assembly and

adapted to be connected at its distal end to a gas source; and

an air inlet pipe connected between said port seal and said



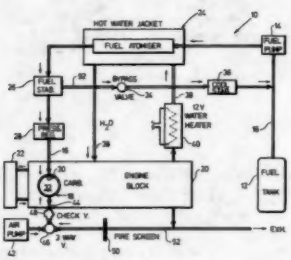
reed valve assembly for feeding air therebetween such that when said piston closes said one inlet port, air from said air inlet pipe will close said reed valve to prevent further flow of gas.

4,679,539

VAPOR LOCK CONTROL AND FUEL ECONOMIZER

George D. Storbakken, 10677 Ogden Ave., Boise, Id. 83709

Filed Dec. 10, 1985, Ser. No. 807,464
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—557 **4 Claims**



1. A fuel economizer system operably attachable to an existing fuel supply system associated with an internal combustion engine, wherein said existing fuel supply system includes a fuel pump means for drawing fuel from a fuel supply means and delivering said fuel through a fuel supply conduit to a carburetor means attached to said internal combustion engine, said fuel economizer system comprising:

a. fuel heating means serving to heat said fuel prior to delivery to said carburetor means;

b. a fuel stabilizer means liquidly interconnected with said fuel supply conduit, consisting of a chamber for receiving heated fuel from said fuel heating means, and serving to direct excess liquid and vaporized fuel to a bypass metering valve means for redelivery to an inlet side of said fuel pump means while also serving to direct a smooth flow of heated liquid fuel to said carburetor means;

c. a fuel pressure regulator for operably controlling flow rate and pressurization of said fuel to said carburetor means;

d. said fuel heating means, said fuel stabilizer means, and said fuel regulator so configured that said fuel passes through said fuel heating means first, through said fuel stabilizer means second, and lastly through said fuel pressure regulator before delivery to said carburetor means; and,

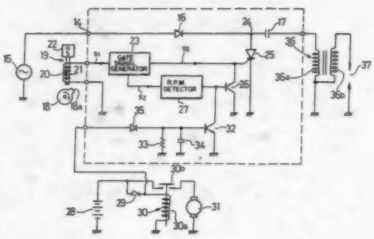
e. fuel cooling stabilizer means for cooling excess fuel delivered to said fuel stabilizer means wherein said excess fuel is redelivered to said fuel pump means.

4,679,540

IGNITION SYSTEM

Masao Abe, Asaka, and Nobuo Miura, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 775,877, Sep. 13, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,190
Claims priority, application Japan, Sep. 13, 1984, 59-193414
Int. Cl.[4] F02P *3/06*
U.S. Cl. 123—602 **1 Claim**



1. An ignition circuit for an internal combustion engine comprising

(a) an ignition circuit generating an ignition timing signal,

(b) an inhibition circuit comprising an r.p.m. detector circuit and a first gating circuit shunting said first gating circuit in response to output from said r.p.m. detector circuit, for inhibiting generation of said ignition timing signal when the r.p.m. of said engine is below a predetermined value;

(c) an interruption circuit comprising series connection of a second gating circuit to said inhibition circuit and a time-constant-discharge-circuit comprising a parallel connection of a resistor and a capacitor, and a diode preventing rapid discharge of said capacitor;

(d) said time constant discharge circuit shunting said second gating circuit and preventing operation for said inhibition circuit in response to charged voltage in said capacitor when a starter switch is in "ON" position, and continuing to shunt said second gating circuit and to prevent operation of said inhibition circuit in the "ON" position of said starter switch and for a constant time period, just after said starter switch is turned to "OFF" position in response to still charged voltage in said capacitor.

4,679,541

BELT-CONFIGURED SAW FOR CUTTING SLOTS INTO STONE

Donald D. Fish, Bedford, Ind., assignor to W. F. Meyers Company, Inc., Bedford, Ind.

Continuation-in-part of Ser. No. 657,833, Oct. 5, 1984, Pat. No. 4,603,678. This application Jul. 12, 1985, Ser. No. 754,675
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 **5 Claims**

1. A device for cutting a slot in stone comprising:

a main frame;

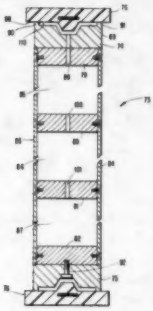
a jib movably mounted to said frame, said jib having a groove surface defining a groove and including water outlet means opening in said groove, said jib including a pair of spaced apart extensions on opposite sides of said groove extending the length of said groove;

a pair of spaced apart and aligned sheaves being rotatably mounted and with at least one of said sheaves having lateral width and being mounted to said jib;

means on said frame and operably associated with said sheaves being operable to rotate same;

a flexible belt extending through said groove with a top and opposite sides and extending around and in driven engagement by said sheaves, said sides defining the width of said belt which is sized at least equal to said lateral width

allowing said one sheave to pass through a slot cut by said belt as said jib moves said belt through said slot, said belt having a continuous bottom projection facing inwardly into said groove being spaced from said groove surface along the length of said groove by water flowing outwardly from said water outlet means, said groove is complementary in shape to said projection positioned therein, said belt further having a pair of inwardly facing edge surfaces spaced apart by said projection; and,



water means on said jib and in communication with said water outlet means and being operable to emit water between said groove and said projection on said belt to provide lubrication therebetween,

said extensions forming limit means mounted on said jib and extending adjacent said belt at said inwardly facing edge surfaces allowing water to be maintained in said groove as said extensions support said belt on said inwardly facing edge surfaces limiting flow of water outwardly between said extensions and said belt.

4,679,542

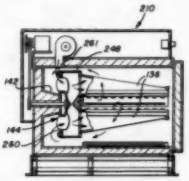
FAN-PLENUM CONFIGURATION

Donald P. Smith, 4530 Woodfin Dr., Dallas, Tex. 75220, and Virgil L. Archer, Dallas, Tex., assignors to Donald P. Smith, Dallas, Tex.

Continuation of Ser. No. 359,921, Mar. 19, 1982, abandoned. This application Dec. 31, 1985, Ser. No. 815,666

Int. Cl.⁴ A21B *1/00*

U.S. Cl. 126—21 A **18 Claims**



1. An impingement device for processing food products comprising:

an enclosure defining a chamber for receiving a food product therein,

means for supporting said food product within the chamber,

a plurality of duct means mounted in said chamber, nozzles in each of said duct means shaped and spaced to form a plurality of discrete streams of gas each stream vertically impinging upon a discrete area of said food product and diffusing upon contact with said food product, at least one duct means positioned above and one duct means positioned below said food product supporting means for directing gas through said nozzles in said duct means to impinge upon the food product on said supporting means,

a plenum in said chamber for enclosing a reservoir of gas, said plenum being positioned adjacent an edge of said supporting means and having said duct means connected thereto, said plenum having one side with outlet openings in communication with said duct means and having another side with an inlet opening therein, said plenum being of a size and shape to extend above and below said supporting means and being spaced inwardly from said enclosure whereby a flow path for gas in said chamber is formed both above and below said plenum to allow gas to return to said inlet opening after contacting said food product,

impeller means positioned in said chamber at said inlet opening for providing a supply of pressurized gas to said plenum from said chamber,

deflector means in said plenum, said deflector means being shaped and positioned relative to said impeller means to direct gas from said impeller means into said duct means whereby gas is caused to flow through said nozzles in said ducts to impinge vertically upon said food product and once contacting said food product to return around said plenum and to said impeller means by paths which extend above and below said plenum, and means for moving said food product within said chamber relative to said duct means whereby the impingement jets formed by the nozzles of said duct means are moved across the surface of said food product.

4,679,543

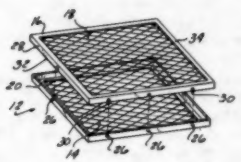
HOLDER FOR RETAINING REFRACTORY MATERIALS

John H. Waltman; Wesley J. Stewart, both of Pontiac, and Gerald E. Leroux, Clarkston, all of Mich., assignors to JWG Enterprises, Pontiac, Mich.

Filed Feb. 18, 1986, Ser. No. 830,219

Int. Cl.⁴ A47J *37/00*

U.S. Cl. 126—25 R **1 Claim**



1. In an outdoor gas-fired grill including refractory materials for cooking food with radiant heat, the improvement of an adjustable-refractory-material-retaining holder comprising:

a pair of refractory-material-retaining trays, each member of said pair comprising at least one side wall, a flange integral with and projecting horizontally from an edge of at least one side wall, and a flat refractory-material-retaining open mesh supported by the flange and fastened thereto, wherein one member of said pair of refractory-material-retaining trays may be telescopically received by the other member so that the flat, refractory-material-retaining open meshes thereof are in substantially parallel, spaced-apart relation with respect to each other;

a plurality of vertically disposed slots formed in the at least one side wall of one member of the pair of refractory-material-retaining trays; and

a plurality of screws extending horizontally from the at least one side wall of the other member of the pair of refractory-material-retaining trays at locations thereon corresponding to the locations of the plurality of slots, each of said plurality of screws being capable of being passed through its corresponding slot and tightened down at a selected position along the vertical length of the corre-

sponding slot for adjustably fastening the pair of refractory-material-retaining trays together to accommodate refractory material of varying sizes, the selected position chosen at a distance apart sufficient to retain a selected refractory material of particular size between the pair of refractory-material-retaining trays.

4,679,544

THREADED ADJUSTABLE GAS INTAKE ASSEMBLY

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Continuation-in-part of Ser. No. 768,853, Aug. 23, 1985, which is a continuation-in-part of Ser. No. 617,949, Jun. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 548,723, Nov. 4, 1983, Pat. No. 4,478,205, which is a continuation-in-part of Ser. No. 548,724, Nov. 4, 1983, Pat. No. 4,488,534. This application Oct. 25, 1985, Ser. No. 791,315

Int. Cl.[4] F24B *3/00*

U.S. Cl. 126—41 R **14 Claims**

1. A multi-adjustable gas intake assembly for a gas burner element which can provide connection between varying position of gas controls and gas burners including both vertical and horizontal adjustment comprising:

a first tubular gas conveying member defining a combined flexible and threaded portion;

a second tubular gas conveying member defining a combined flexible and threaded portion, said flexible and threaded portions of said first and second tubular members constructed and arranged to threadably engage each other, at least one of said first and second tubular members being freely movable in a threaded manner with respect to the other and vertically and horizontally adjustable;

air regulator and gas supply inlet means on one of said tubular members

said air regulator and gas supply inlet means including an opening into said tubular member to effect mixing of gas and air;

and

means operatively associated with the other of said tubular members for connection with a gas burner element.

4,679,545

GAS-FIRED OUTDOOR SPA AND HOT TUB HEATER

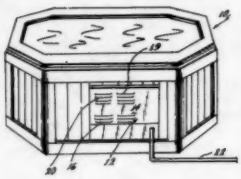
Adrian V. Cavestany, Moorpark, Calif., assignor to Raypak, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 778,436, Sep. 20, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,465

Int. Cl.[4] F24H *1/00*

U.S. Cl. 126—350 R **6 Claims**

1. A portable spa unit having peripheral walls and adapted for outdoor use containing heated water, the said spa unit having one side wall adapted to receive a heater, the said heater having a panel exposed to the outside of the spa unit and positioned substantially flush with the outside wall of the spa, a self-contained, gas fired water heater constructed to be contained within said one side wall of the spa unit, the heater having connections to the interior of the spa unit for the water to be passed through the heater to be heated, the heater including a gas burner and means including connections for supplying gas to the burner, the panel having openings for the admis-



sion of combustion air from outside the spa unit and having openings for the discharge of gases of combustion to outside of the spa unit, and circulating means for circulating combustion gases from the burner and discharging the said gases from the heater through said discharge openings in said panel, and said circulating means having means for limiting the temperature of the gases being discharged whereby to limit the temperature of said exposed panel of the heater unit.

4,679,546

IMPLANTABLE SHUT-OFF DEVICE

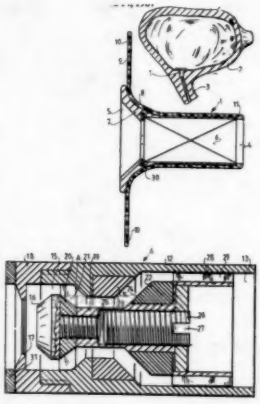
Ernst S. C. van Waalwijk van Doorn, Wijchen; Joseph D. M. de Vries, Malden, and Franciscus J. M. de Vries, Wassenaar, all of Netherlands, assignors to Applied Medical Technics B.V., Wijchen, Netherlands

Filed Oct. 16, 1985, Ser. No. 788,155

Claims priority, application Netherlands, Oct. 17, 1984, 8403174

Int. Cl.[4] A61F *1/00;* **A61M** *25/00*

U.S. Cl. 128—1 R **10 Claims**



1. Shut off device particularly suitable for implantation in a urethra comprising a tubular housing having attachment means for permanent fitting on the wall tissue of said urethra, a valve system located in said tubular housing for respectively closing off and leaving clear the passage in said housing, means for disconnectably coupling said valve system to said housing, and said valve system consists of a cylindrical body having a valve

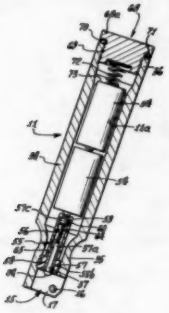
seat, a valve co-operating therewith and means for pressing said valve and said seat against one another.

4,679,547

FLUID SUBMERSIBLE LARYNGOSCOPE

Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272

Filed Feb. 19, 1986, Ser. No. 830,738
Int. Cl.[4] A61B *1/26*
U.S. Cl. 128—10 **10 Claims**



1. In a fluid submersible laryngoscope including a hollow handle to contain power supply means, a blade to be inserted into a patient's mouth, and means to removably attach the blade to an end portion of the handle in a substantially L shaped configuration, the improvement comprising:

(a) a terminal pin carried by the handle at said end portion of the handle,

(b) means to place the terminal pin in electrical energy transmitting relation with light bulb carried by the blade, when the blade is attached to the handle,

(c) and first fluid sealing means between the terminal pin and handle to block access of external fluid into the hollow handle, whether or not the blade is attached to the handle, and when the handle is submerged in fluid,

(d) said fluid sealing means comprising a tubular elastomeric body carrying said terminal pin, the pin having an enclosed shank in fluid sealing and retained relation with a bore defined by said elastomeric body whereby center extent of the elastomeric body is resiliently yieldable axially of the handle to allow the pin and said center extent of the body to deflect axially when the blade is fully attached to the handle and said electrical energy transmitting relation is established to energize the bulb, the pin having ahead on the shank projecting endwise outwardly of said elastomeric body, said body having an exterior generally annular surface in fluid sealing engagement with a bore defined by the handle.

4,679,548

RE-EDUCATION APPARATUS FOR THE ARTICULATED SEGMENTS OF THE HAND

Jean-Claude R. Pecheux, Charleville Mezieres, France, assignor to Compagnie Generale de Material Orthopedique, France

Filed Jan. 25, 1985, Ser. No. 695,162
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—26 **15 Claims**

1. An apparatus for restoring mobility to the articulated segments of the hand, comprising:

a driving member with at least one driving shaft, on which is fixed only one radial slide-guide;

a sliding block guided by said slide-guide and operationally coupled to a return member urging said sliding block in centrifugal movement with respect to the shaft;

a support for resting the hand, which support extends in parallel to the axis of the shaft;

at least one bar carried by the sliding block and extending in parallel to the support;

means of joining said bar to at least one articulated segment of the hand; and

means of driving said sliding block in centripetal movement, in relation to the angular displacement in one direction of

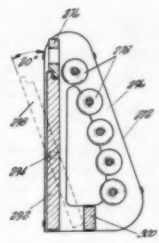
the slide-guide driven by the shaft, wherein the driving means is comprised of at least one wire or cable which is flexible but non-stretchable and extends sideways of the slide-guide between the sliding block and substantially the center of angular rotation of said slide-guide, and by a fixed cam carried by the structure of the driving member and offering, inside the plane in which the wire or cable moves when said slide-guide is angularly displaced, an evolutive bending profile for driving the sliding block centripetally in relation with the angular movement of the slide-guide.

4,679,549

INTEGRAL FOOT MASSAGE AND SUPPORT APPARATUS

William M. Quam, and Dorothy M. Quam, both of 241 Conejo Rd., Santa Barbara, Calif. 93103

Division of Ser. No. 516,700, Jul. 22, 1983, which is a continuation-in-part of Ser. No. 445,196, Nov. 29, 1982. This application Nov. 21, 1984, Ser. No. 656,265
Int. Cl.[4] A61H *15/00*; A63B *23/04*
U.S. Cl. 128—57 **6 Claims**



3. An integral foot massage and support comprising

a base plate having a substantially planar surface for defining a support when the base plate is placed on a support surface and defining a foot receiving surface when the base plate is positioned in a spaced opposed position to the support surface;

housing means operatively coupled to said base plate and including means for defining side members; and

a plurality of massage assemblies each of which includes an axially extending center support member and a plurality of annular shaped massage elements mounted

axially on and rotatable about said center support members, said center support members being mounted between said side members at an angle which approximates the ergonomic design angle which is at least 10° to about 20°, said ergonomic design angle being selected so as to reduce fatigue, stress and discomfort of the thigh, lower leg and foot of a human user in a sitting position, said base plate being pivotable relative to said housing to change the angle thereof independent of said ergonomic design angle enabling the feet of a human user to exercised.

4,679,550

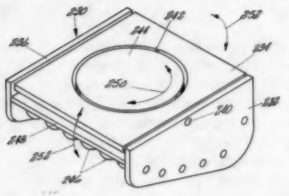
INTEGRAL FOOT MASSAGE AND SUPPORT APPARATUS

William M. Quam, and Dorothy M. Quam, both of 241 Conejo Rd., Santa Barbara, Calif. 93101

Continuation-in-part of Ser. No. 445,196, Nov. 29, 1983. This application Jul. 22, 1983, Ser. No. 516,700

Int. Cl.[4] A61H *15/00*; A63B *23/04*

U.S. Cl. 128—57 **8 Claims**



1. A combined foot massage and support comprising

a base support including a base plate having a substantially planar surface and a second opposite surface, said base plate having a circular shaped opening located centrally therein;

a pair of substantially planar side support members each of which terminate in a first support end and a second support end, said first support end of each of said side support members including means defining a substantially planar support surface and said second support end of each of said side support members being located opposite said first support end and including means defining a ramp support surface has a slope which approximates the ergonomic design angle which is adapted to reduce fatigue, stress and discomfort of the thigh, lower leg and foot of a human user in a sitting position, said substantially planar side support members being operatively coupled to and extending from said base support and base plate and in a spaced parallel relationship to each other with the substantially planar support surface of each of said side support members positioned adjacent said base support and with the ramp support surface of each of said side support members positioned with the slope of the ramp support surface extending in the same direction;

a plurality of massage assemblies each of which includes an axially extending center support member and a plurality of annular shaped massage elements mounted axially on and rotatable about said center support members, said center support members being mounted in an arcuate, spaced parallel alignment between said spaced parallel planar side support members above said base support and above said opposite side of the base plate, said plurality of massage elements being mounted on said center support members and having a radius which extends therefrom to below said ramp support surfaces to form a convex shaped, angularly disposed treating surface which extends substantially between said substantially parallel side support members; and

means including a rotatable disc positioned in said circular opening in said base plate which is adapted to be engaged and rotated by at least one foot of a user;

said foot massage and support being adapted to have a massage position wherein the base support, the substantially planar surface of the base plate and the substantially planar surface of the side support members are positioned on a supporting surface placing the convex shaped, angularly disposed treating surface in a massage position which is adapted to receive the feet of a user which may be massaged by movement of the feet relative to the rotatably mounted massage elements and a support position wherein the ramp support surfaces of the second support end of each side support members are positioned on a supporting surface placing the base support including the substantially planar surface of the base plate at an angle to receive and support the feet of a user.

4,679,551

DEVICE FOR PERFORMING THERAPEUTIC TREATMENTS

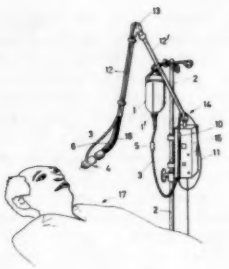
Jean M. Anthony, Antwerpen, Belgium, assignor to Tomtec, N.V., Antwerpen, Belgium

Filed Feb. 22, 1985, Ser. No. 704,631

Claims priority, application Belgium, Feb. 23, 1984, 2/60347; Mar. 26, 1984, 2/60374; Apr. 25, 1984, 2/60398; Oct. 23, 1984, 0/213872

Int. Cl.[4] A61B *19/00*; A61M *35/00*

U.S. Cl. 128—67 **6 Claims**



1. Apparatus for moistening a body area of a patient, comprising:

holding means to hold a supply of a liquid;

ultrasonic spray means having an activated state to spray the liquid onto the body area, and a deactivated state wherein the spray means does not spray the liquid onto the body area;

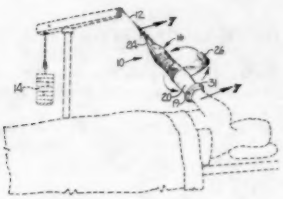
liquid conducting means connected to the holding means and to the ultrasonic spray means, and having an open position to conduct liquid from the holding means to the ultrasonic spray means, and a closed position to prevent the liquid from passing from the holding means to the ultrasonic spray means; and

control means connected to the liquid conducting means to regularly move the liquid conducting means between the open and closed positions a plurality of times during a pre-determined interval, and further connected to the ultrasonic spray means to regularly change said ultrasonic spray means between the activated and deactivated states a plurality of times during the predetermined interval, the control means maintaining the ultrasonic spray means in the activated state for a brief period each time after the liquid conducting means is moved from the open position to the closed position during the predetermined interval, to inhibit the accumulation of fluid in the ultrasonic spray means when said ultrasonic spray means is in the deactivated state.

4,679,552
DRAPE FOR ARTHROSCOPIC SURGERY

Richard B. Caspari, Maidens, Va., assignor to Chattanooga Corporation, Chattanooga, Tenn.

Filed Oct. 18, 1985, Ser. No. 788,784
Int. Cl.[4] A61F 5/04, 13/00
U.S. Cl. 128—132 D 9 Claims



1. A surgical drape adapted for protectively covering a limb of a patient during arthroscopic surgery or the like and while applying traction to the limb, and comprising

a tubular sleeve of flexible sheet material, with said sleeve having a length adapted to receive at least a substantial portion of the length of the limb of the patient,

traction pad means mounted within a portion of said tubular sleeve, with said pad means having a length dimension sufficient to extend along a substantial portion of the length of the limb, and having portions thereof which are adapted to lie along opposite sides of the limb of the patient which is received in the sleeve,

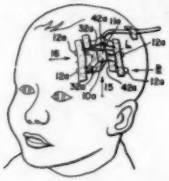
strap means positioned on the outside of said tubular sleeve and having opposite ends attached through said sleeve to said traction pad means, and

wrap means for encircling the sleeve when the limb of a patient is received therein to circumferentially bind the tubular sleeve upon the limb, and such that a traction force may be applied to said strap means which results in the traction force being applied to the limb which is distributed along the elongate contact area beween said traction pad means and the intermediate limb.

4,679,553
VENIPUNCTURE SITE PROTECTOR

Raymond E. Proulx, 5837 Cameo, Alta Loma, Calif. 91701, and Frank J. Rauscher, 5908 Mt. View Ave., San Bernardino, Calif. 92407

Continuation-in-part of Ser. No. 554,768, Nov. 23, 1983, abandoned. This application May 17, 1985, Ser. No. 735,331
Int. Cl.[4] A61M 5/00
U.S. Cl. 128—133 5 Claims



1. A venipuncture site protector, comprising:

a body constructed of relatively non-elastic thin and stiff but readily bendable material and including a cup-like shield mounting tabs extending from said shield,

said shield having an open end, an opposite closed end, four side walls, a rectangular end wall closing said closed end and joined along its edges to said side walls, and a generally rectangular cross section in planes parallel to said end wall,

said mounting tabs including a pair of laterally spaced tabs extending outwardly from each of two opposite sides of said shield and joined to the corresponding opposite side walls of said two opposite sides along junctures disposed substantially in the plane of said open shield end,

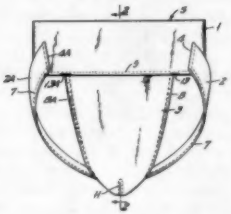
said two corresponding opposite side walls and the two remaining opposite shield side walls having end edges at said open end of said shield and notches entering said side wall edges, the notches in each pair of said opposite walls being aligned for receiving through one of said notches of each pair of said opposite side walls a holder mounting an intravenous needle entering the venipuncture site with the holder positioned within said one notch and needle extending subcutaneously toward the other notch of the respective pair of said opposite side walls, and

said one notch of each pair of said opposite side walls being larger than said other notch of said opposite side wall of said pair and occupying a major portion of the respective side wall for receiving the needle holder, and said other notch of the other respective pair of said opposite side walls providing clearance for the patient's skin above the needle.

4,679,554
ATHLETIC SUPPORTER

Daniel S. Markham, 124 Irving St., Laurel, Md. 20707

Filed Apr. 23, 1985, Ser. No. 726,159
Int. Cl.[4] A61F 5/40
U.S. Cl. 128—158 15 Claims



1. In an athletic supporter having in combination as elements of construction a waistband, leg straps and a genital-supporting pouch, the improvement,

wherein at least the waistband and the pouch consist essentially of a knitted or woven fabric of elasticized polypropylene fiber formed of polypropylene and spandex fibers with the polypropylene fiber constituting the major portion of the fabric, said fabric having a coefficient of stretch in all directions of at least 50% per linear inch and a recovery to the unstretched state in excess of about 95%,

said polypropylene fabric being characterized by a substantial degree of moisture transfer, with the fibers thereof substantially non-absorbant to moisture,

said polypropylene fiber having a specific gravity of approximately 0.9.

4,679,555
METHOD AND APPARATUS FOR INTRAPULMONARY DELIVERY OF HEPARIN

Marvin A. Sackner, Miami Beach, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Aug. 7, 1984, Ser. No. 638,587
Int. Cl.[4] A61M 15/00
U.S. Cl. 128—203.15 9 Claims

6. A method of intrapulmonary administration of heparin, comprising the steps of:

releasing a metered dose of aerosolized powdered heparin

from a pressurized canister containing powdered heparin and a low boiling point propellant;

inhaling the metered dose of aerosolized powdered heparin into the lungs of a patient;

repeating the releasing and inhaling steps until a pharmaceutically effective amount of the heparin has been delivered to the patient.

4,679,556

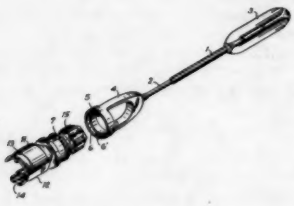
RELEASABLE HOLDER AND METHOD OF USE

Paul Lubock, Laguna Hills, and Mike Sullivan, San Clemente, both of Calif., assignors to Shiley Inc., Irvine, Calif.

Filed Apr. 16, 1986, Ser. No. 852,699

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—303 R **7 Claims**



1. A device for releaseably holding an object which comprises:

an elongated rod having a proximal end and a distal end,

said rod being attached at its proximal end to a handle and at its distal end to a bifurcated member terminating in a ring enclosing a circular key member,

a holder member readily attachable and detachable to said ring,

said holder member terminating in at least two cooperating fingers and having a resilient cylindrical head with an axial screw thread, said fingers being adapted to engage with and grip an object to be held and said cylindrical head being adapted to be locked through a snapping engagement, within said circular key member, and

an engaging screw located in said screw thread and adapted to interact with said holder member so as to control and limit the movement of said fingers and thereby, upon turning, to engage and disengage said fingers with respect to a desired object.

4,679,557

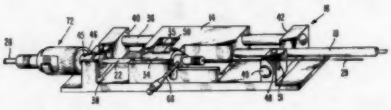
ELECTRODYNAMIC TRANSLUMINAL ANGIOPLASTY SYSTEM

Eric A. Opie, and Thomas J. Clement, both of Seattle, Wash., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 10, 1984, Ser. No. 649,101

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 **14 Claims**



1. An electrodynamic transluminal angioplasty system comprising:

(a) a prime mover having a drive shaft;

(b) an advancer assembly comprising a body having a saddle formed therein and a carriage which is adapted to move within said saddle;

(c) means for connecting a drive wheel in said carriage to said drive shaft of said prime mover;

(d) catheter engagement coupling means including a driven wheel for connecting a rotatable catheter to said drive wheel, whereby said driven wheel in said catheter engagement coupling means can be driven by said drive wheel in said carriage thereby rotating said catheter.

4,679,558

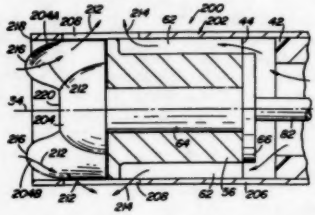
CATHETER BASED SURGICAL METHODS AND APPARATUS THEREFOR

Kenneth Kensey, Hinsdale, Ill., and John Nash, Downingtown, Pa., assignors to Intravascular Surgical Instruments, Inc., Telford, Pa.

Division of Ser. No. 765,034, Aug. 12, 1985. This application Sep. 22, 1986, Ser. No. 909,802

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—328 **23 Claims**



1. The method of disentegrating a stone within the body of a living being by utilizing an elongated, small diameter, flexible catheter having a longitudinal axis and a distal end at which a working head is located, said working head being arranged for high speed movement with respect to said axis by associated drive means, said drive means arranged to freely effect the movement of said working head even if said catheter is bent through any arc up to a minimum radius of curvature and without resulting in excessive vibration which could interfere with the stone disentegration process, said method comprising inserting said catheter into said body from a remote location, causing said drive means to move said working head at a high rate of speed and advancing said catheter into contact with said stone along said axis as said working head is moving, whereupon the mechanical action of said moving working head causes the disentegration of said stone.

4,679,559

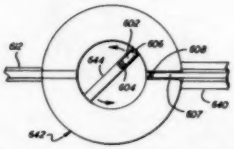
METHOD AND DEVICE FOR TAGGING A MACRO-ORGANISM

Keith B. Jefferts, Shaw Island, Wash., assignor to Northwest Marine Technology Inc., Shaw Island, Wash.

Filed Oct. 7, 1986, Ser. No. 916,165

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—330 **16 Claims**



12. A device for tagging a macro-organism, comprising:

a hollow injection needle at least partially insertable into body tissues of the macro-organism;

a wire at least partially disposable in said needle for pushing a tag through said needle, said needle having an inner diameter larger than an outer dimension of said tag and said wire, said needle and said wire defining an injection path;

means located along said path for severing an end portion from a leading end of said wire;

means located along said path for magnetizing said end portion, the magnetized and severed end portion constituting said tag, said tag having a magnetic field with a first orientation, said leading end of said wire having, upon formation of said tag, a magnetic field with a second orientation;

means engageable with said wire for moving said wire through said needle to thereby push said tag into body tissues of the macro-organism upon a partial insertion of said needle into said bc,dy tissues; and

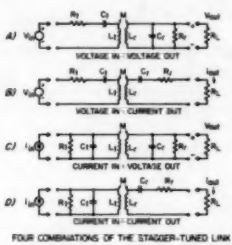
means, operatively connected to at least one of said means for magnetizing and said means for severing, for setting said first orientation and said second orientation to be opposite to one another at least in a region about a rear end of said tag and said leading end of said wire immediately prior to and immediately after injection of said tag into the macro-organism, whereby said leading end of said wire repels said tag and thereby prevents said tag from being withdrawn from the body tissues of the macro-organism together with said wire.

4,679,560

WIDE BAND INDUCTIVE TRANSDERMAL POWER AND DATA LINK

Douglas C. Galbraith, Stanford, Calif., assignor to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 2, 1985, Ser. No. 719,232
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 R **14 Claims**



FOUR COMBINATIONS OF THE STAGGER-TUNED LINK

1. An inductive link for conveying power and/or data through the skin of a user comprising a first external coil, a second medically implantable coil, the coils being movable relative to one another, the mutual inductive coupling of said coils changing with their position relative to one another, and a means for stagger tuning said first and second coils to maintain a gain which is relatively independent of the coil's mutual coupling at a selected frequency or frequency band of interest.

4,679,561

IMPLANTABLE APPARATUS FOR LOCALIZED HEATING OF TISSUE

James D. Doss, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

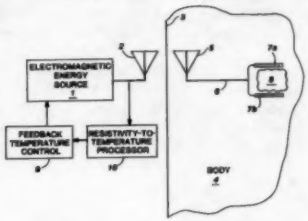
Filed May 20, 1985, Ser. No. 736,021
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—422 **6 Claims**

1. An apparatus for locally increasing the temperature of living tissue located inside of a body, said apparatus comprising in combination:

a. means disposed externally to the body for generating radio-frequency electromagnetic energy having a chosen intensity;

b. first antenna means for receiving and for radiating the radio-frequency electromagnetic energy from said means for generating radio-frequency electromagnetic energy, said first antenna means being adapted for placement at substantially the closest location external to the body to the tissue to be heated;

c. second antenna means closely coupled to said first antenna means for receiving the radiated electromagnetic energy and for generating an alternating voltage therefrom having a first electrical connection and a second electrical connection, said second antenna means being adapted for location within the body near an accessible outer surface thereof in order to facilitate receiving the radiated electromagnetic energy, whereby the alternating voltage appears between said first electrical connection and said second electrical connection;



d. at least one first electrode means being in electrical contact with said first electrical connection and at least one second electrode means being in electrical contact with said second electrical connection for receiving the alternating voltage appearing between said first electrical connection and said second electrical connection of said second antenna means, said at least one first electrode means and said at least one second electrode means being adapted for location within the tissue to be heated in the vicinity of at least one of said first electrode means and said second electrode means causing thereby an increase in temperature therein; and

e. means for externally measuring the voltage current characteristics of said first antenna means for determining the increase in temperature within the tissue to be heated, said means for externally measuring the voltage current characteristics of said first antenna means having parametric dependence on the change in electrical resistance within the tissue to be heated resulting from the increase in temperature therein.

4,679,562

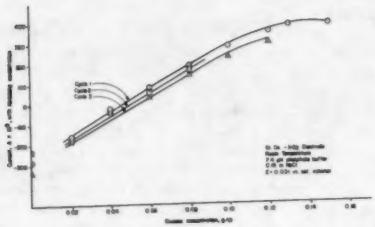
GLUCOSE SENSOR

Eugene Luksha, Golden Valley, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 466,881, Feb. 16, 1983, abandoned.
This application May 9, 1986, Ser. No. 861,347
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—635 **6 Claims**

1. Glucose sensor means for in-vivo generation of an electrical signal in response to the presence of glucose in the bloodstream and thereby electrically determining blood glucose concentrations, said sensor means comprising an iridium substrate with an in-situ oxidized outer surface of iridium oxide to which are bonded first and second superposed films, said first

film being bonded to said iridium oxide surface and consisting essentially of silanized gamma aminopropyltriethoxysilane,



and with said second film consisting essentially of glucose oxidase and being covalently bonded in-situ onto said first film.

4,679,563

BIOMEDICAL ELECTRODE

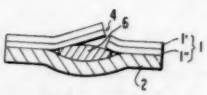
Shintaro Wada; Hisanori Takahashi, and Yoichi Nomura, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 761,723, Aug. 2, 1985. This application Jan. 28, 1986, Ser. No. 823,175

Claims priority, application Japan, Oct. 8, 1984, 59-152182[U]; Oct. 8, 1984, 59-152183[U]; Dec. 27, 1984, 59-201623[U]; Dec. 27, 1984, 59-201624[U]

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—640 **9 Claims**



1. A biomedical electrode comprising a flexible electrode plate capable of conforming to a skin surface of a living body, an electrically conductive adhesive layer adhered to a first portion of said electrode plate and to a non-tacky member not adhered to said electrode plate interpositioned between a second portion of said electrode plate and said conductive adhesive layer, wherein the second portion of said electrode plate has a cut therein which provides a tongue adapted to be connected to a terminal of a biomedical diagnostic device.

4,679,564

MONITORING ELECTRODE ATTACHABLE TO A PATIENT

Robert W. Sessions, German Church Rd., Hinsdale, Ill. 60521

Filed Oct. 4, 1984, Ser. No. 657,588

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—640 **9 Claims**

1. An electrode attachable to a patient for use with electronic medical monitoring or diagnostic equipment, said electrode comprising:

a foam pad;

a non-conductive carrier attached to one side of said of said foam pad having a conductive metallized strip thereon at a side of said carrier facing away from said foam pad;

a conductive film strip overlying at least said conductive metallized strip, said conductive film strip extending beyond said conductive metallized strip on each side thereof and covering said carrier and a portion of said foam pad;

an adhesive layer covering said side of said foam pad on which said non-conductive carrier is attached and also covering said conductive film strip; and

a means for electrically connecting said conductive metallized strip to a lead of said diagnostic or monitoring equipment.

4,679,565

ULTRASONIC DIAGNOSTIC APPARATUS USING NON-LINEAR PARAMETERS OF AN ORGAN

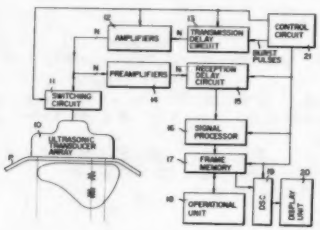
Hiroshi Sasaki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 23, 1985, Ser. No. 790,471

Claims priority, application Japan, Oct. 23, 1984, 59-222715

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **10 Claims**



3. An apparatus for obtaining a non-linear parameter of an object comprising:

ultrasonic transducer means for directing ultrasonic waves into an object and receiving echoes reflected from the object;

scanning means coupled with said transducer means for activating said transducer means to sequentially send two ultrasonic burst waves of respective first and second frequencies into the object, the two ultrasonic bursts being separated by a predetermined time interval so that echoes of the first ultrasonic burst wave of the first frequency reflected from the object are mixed within the object with the second ultrasonic burst wave of the second frequency reflected from the object;

means coupled with said transducer means for activating said transducer means to detect echoes of the reflected waves from the object having the first frequency as a function of time;

means coupled with said transducer means for activating said transducer means to detect echoes of the reflected waves from the object having the differential frequency between the first and second frequency created by the mixing of the two ultrasonic burst and the reflection of those mixed waves from the object;

storing means coupled with said transducer means for storing the echos of the first frequency and the echoes of the differential frequency; and

calculating means coupled with said storing means for obtaining the non-linear parameter of the object by comparing the stored echoes of the differential frequency with the stored echoes of the first frequency.

4,679,566

APPARATUS FOR MEASURING PULSE RATE, VITAL CAPACITY AND PULMONARY PEAK FLOW

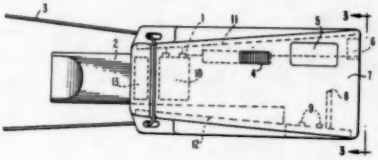
Ulf S. Tamm, 124 S. Compo Rd., Westport, Conn. 06880

Continuation-in-part of Ser. No. 699,232, Feb. 8, 1985, Pat. No. 4,598,700, which is a continuation of Ser. No. 475,217, Mar. 14, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 842,837

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—671 **18 Claims**



1. A portable apparatus for measuring pulse rate and pulmonary peak flow of a person comprising:

a case having means formed therein for transmitting expired air therethrough and for receiving a portion of a person's body to measure pulse rate;

means for measuring pulmonary peak flow disposed within said means for transmitting expired air and for receiving a portion of a person's body;

means for measuring pulse rate disposed within said means for transmitting expired air and for recieing a portion of a person's body; and

a source of electrical power disposed within said case and connected to said means for measuring pulmonary peak flow and said means for measuring pulse rate for operating said means for measuring pulmonary peak flow and for operating said means for measuring pulse rate.

4,679,567

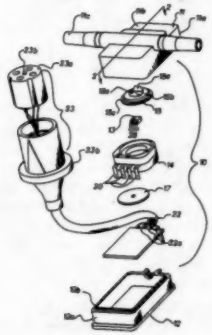
PRESSURE TRANSDUCER

Stephen P. Hanlon; Walter L. Kerby, both of Sandy; Edmund R. Purdy, Fruitheights, and James Strom, Salt Lake City, all of Utah, assignors to Deseret Medical, Inc., Sandy, Utah

Filed Feb. 4, 1986, Ser. No. 826,056

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—675 **15 Claims**



1. A pressure transducer assembly for monitoring pressure in a fluid comprising:

a hollow body having an open chamber and a uniformly dimensioned passage defining a flow path with an inlet and outlet port in fluid flow communication with said flow path and an opening in said flow path extending to said chamber,

a mounting means being an electrical insulator and having a centrally opened web with a receiving well extending outwardly therefrom and a transducer supporting portion in communication therewith,

a lid means having a first area shaped to close a part of said opening and maintain a section of said uniformly dimensioned passage and a second area configured to fit within said mounting means receiving well and said first and second areas having a passageway extending therethrough to connect said flow path to the area of said opened web,

a pressure transducer means secured in said supporting portion and exposed to said central opening of said web and said lid means passageway for determining and converting fluid pressure in said flow path into electrical signals,

a fluid pressure responsive media which is electrically nonconductive said media closing the rest of said opening and filling said passageway between said flow path and said transducer,

an electrical conducting means connected to said pressure transducer means and extending through said web and out of said mounted means as electrical connection lugs; and

integrated circuit means mounted to said lugs and connected to an output cable for modifying the signal from said transducer means to permit the signal to be read directly on a measuring instrument.

4,679,568

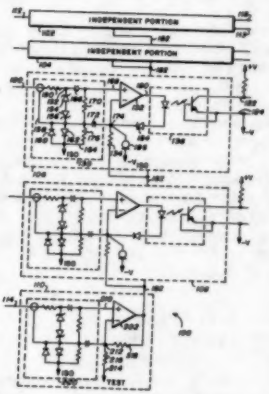
PHYSIOLOGICAL POTENTIAL PREAMPLIFIER

David A. Blau, Los Altos, and William R. Fish, San Jose, both of Calif., assignors to Siegen Corporation, Sunnyvale, Calif.

Filed Sep. 19, 1985, Ser. No. 777,773

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—696 **7 Claims**



1. A preamplifier responsive to a potential developed between a first input line and a common line and operative to develop an isolated potential between a first pair of output lines, the preamplifier comprising in combination:

first operational amplifier means including a non-inverting input, an inverting input, and an output;

first coupling means coupling said first operational amplifier means non-inverting input to the common line;

first resistor means including a first end coupled to said first operational amplifier means and a second end;

second coupling means coupling said first operational amplifier means inverting input to said first operational amplifier means output;

second operational amplifier means including a non-inverting input, an inverting input coupled to said first resistor means second end, and an output;

third coupling means coupling said second operational amplifier means non-inverting input to the first input line;

first optical isolator means including an input portion and an output connected between the first pair of output lines; and

fourth coupling means coupling said first optical isolator means input portion between said second operational amplifier means inverting input and said operational amplifier means output.

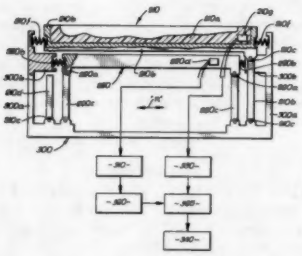
4,679,569
BALLISTOCARDIOGRAPH

Arnold S. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Continuation-in-part of Ser. No. 786,746, Oct. 11, 1985. This application Nov. 7, 1985, Ser. No. 795,894

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—714 **25 Claims**



1. A ballistocardiograph system for accurately and reproducibly preparing a ballistocardiograph of a subject, the system comprising:

steady means for stationing, and thereby reproducibly positioning, a body of the subject by close-fitting confinement and constraint of a large area of skin of the body;

motion limiting means for limiting movement of the steady means to a particular linear direction of movement;

a motion transducer connected to the steady means for producing a ballistocardiograph of body motion caused by blood output through the heart by sensing motion of the steady means within which the body is stationed; and

transfer means for transferring the body into and out of contact with the steady means;

wherein the steady means includes a first rigid body having a negative impression of a portion of the dorsal half of the body of the subject.

4,679,570
PHONOCARDIOSCOPE WITH A LIQUID CRYSTAL DISPLAY

Walter Lund, Berlin; Lou Berman, Bridgeport, both of Conn., and Felix Dothan, Jerusalem, Israel, assignors to Phonocardioscope Partners, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,854

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—715 **6 Claims**

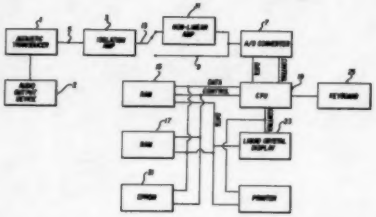
1. A phonocardioscope apparatus for monitoring heart functions said apparatus comprising:

(a) acoustical transducer means for detecting the sound of heartbeats and producing an analog electrical signal in response thereto;

(b) an analog-to-digital converter for converting said analog heartbeat signal to a digital heartbeat signal;

(c) coupling means for coupling said transducer means to said analog-to-digital converter said coupling means including an isolation means for electrically isolating said transducer means from the other elements of said apparatus, non-linear amplifier means coupled to said isolation means for non-linearly amplifying the acoustic heartbeat signal, shunt means connected to said analog-to-digital converter in parallel with said non-linear amplifier means, and switch means for selectively applying the output of said isolation means to said non-linear amplifier means or said shunt means;

(d) memory means coupled to said analog-to-digital converter for storing the digital heartbeat signal;



(e) CPU means coupled to said analog-to-digital converter and to said memory means for controlling the operation thereof;

(f) liquid crystal display means coupled to said memory means and said CPU means, wherein at least a predetermined portion of the digital heartbeat signal data stored in said memory means is displayed by said liquid crystal display means and wherein the display of the digital heartbeat signal data is controlled by said CPU means.

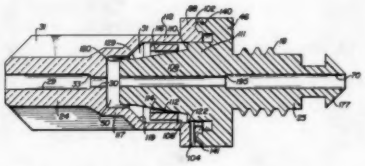
4,679,571
BLOOD SAMPLE NEEDLE ASSEMBLY WITH VEIN INDICATOR

Eric Frankel, New York, N.Y., and Andrzej J. Plucinski, Norwood, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 31, 1984, Ser. No. 645,893

Int. Cl.[4] A61B *5/14*

U.S. Cl. 128—764 **13 Claims**



1. A needle assembly for collecting one or more liquid samples from a source for subsequent discharge into evacuated containers, comprising

(a) a housing having a forward end and a rearward end;

(b) a sample collection chamber in said housing;

(c) a first access opening in said forward end in liquid flow communication with said chamber;

(d) a first cannula extending outwardly from said first access opening for insertion into said source;

(e) a second access opening in said rearward end in flow communication with said chamber;

(f) a second cannula positioned in said second access opening and in flow communication with said chamber;

(g) valve means on said second cannula for controlling discharge of liquid samples from said chamber into evacuated containers attached to said second cannula;

the improvement characterized by

(h) cooperating means on said forward end and said rear-

ward end of said housing providing an annular fluid bleed passage means therebetween;

(i) said fluid bleed passage means being separate from said second access opening and said second cannula;

(j) vent means in said housing providing flow communication with said fluid bleed passage and ambient;

(k) said cooperating means including a tapered hub post on said rearward end, said hub post extending into said chamber;

(l) said hub post having a gradually increasing cross section from said forward end to said rearward end;

(m) an annular compressed tablet forming a central bore positioned on said hub post and comprised of a material responsive to aqueous containing materials adapted to be introduced into said chamber for swelling and closing said fluid bleed passage upon contact with an aqueous containing material passing therethrough; and

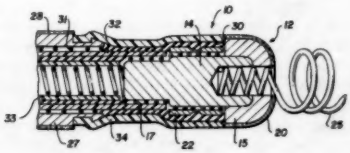
(n) whereby when said first cannula engages said source, aqueous containing liquid enters said chamber, forcing any gas therein through said fluid bleed passage and said vent means, and causing said liquid to come into contact with said tablet which swells and closes said fluid bleed passage.

4,679,572

LOW THRESHOLD CARDIAC PACING ELECTRODES

Ross G. Baker, Jr., Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Mar. 11, 1986, Ser. No. 838,607
Int. Cl.[4] A61N *1/05*
U.S. Cl. 128—786 **11 Claims**



1. A cardiac pacing lead assembly, comprising

an electrode means having a tip portion provided with an exposed surface layer of iridium oxide situated to be in electrically coupled relationship with excitable cardiac tissue of the heart when said lead assembly is implanted in a human patient, for alternatively stimulating said cardiac tissue when said electrode means is electrically energized and sensing electrical activity of the heart in response to said stimulation when said electrode means is de-energized, and

an electrical conductor means electrically connected at one end thereof to said tip portion for delivering electrical energization thereto and for conducting signals representing said electrical activity therefrom, and having terminal means at the other end for connection to a pulse generator of a cardiac pacemaker.

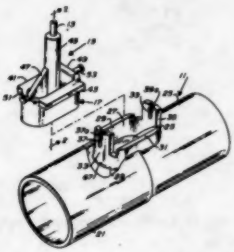
4,679,573

ADAPTOR ASSEMBLY FOR AIRWAY TUBE

George K. Parnoff, Walnut Creek, and Steven L. Sultan, Berkeley, both of Calif., assignors to Andros Analyzers Incorporated, Berkeley, Calif.

Continuation of Ser. No. 670,308, Nov. 8, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,056
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—716 **8 Claims**

1. An adaptor assembly for sampling gas in an airway tube attached to a patient, said adaptor assembly comprising, a tubular section adapted for securing in series with the airway tube, said tubular section having an opening between the opposite ends thereof, sample tube connecting means for securing a sample tube in communication with the interior of said tubular section intermediate the ends thereof, said connecting means being secured to said tubular section at said opening therein and including a filter probe extending a predetermined distance across the interior of said tubular section to provide filtered communication between the interior of said tubular section and



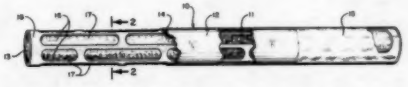
said sample tube, said filter probe having a filter at the end thereof inside said tubular section, said filter having a first filter surface area exposed to the interior of said tubular section and a second surface area opposite said first surface area, means defining a void volume contiguous with said second surface area, said first surface area having a ratio of surface area to void volume in excess of 10 to 1 square centimeters to cubic centimeters.

4,679,574

CIGARETTE

Paul W. Lang, and Franklin C. Gribshaw, both of Orange, Calif., assignors to C. Allen Jensen, Pasadena, Calif.

Filed Feb. 20, 1986, Ser. No. 832,168
Int. Cl.[4] A24D *1/02, 1/12*
U.S. Cl. 131—365 **12 Claims**



1. A smoking device comprising:

a measure of cut tobacco;

a cigarette paper;

said measure of cut tobacco being rolled in said cigarette paper to form a cigarette;

said cigarette paper having an interior surface in direct contact with said measure of cut tobacco; and

a thin layer of refractory material bonded to said paper interior surface;

wherein said thin layer is applied in a pattern, and said pattern is formed by spaced holes in said thin layer.

4,679,575

CIGARETTE

Katsunori Yamaguchi, Kawasaki, and Nagaaki Takemoto, Tokyo, both of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

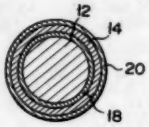
PCT No. PCT/JP84/00420, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO86/01377, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 3, 1984, Ser. No. 758,641
Int. Cl.[4] A24D *1/02;* A24F *1/00*
U.S. Cl. 131—365 **8 Claims**

1. A cigarette comprising:

shredded tobacco;

a rolling material wrapping said shredded tobacco;

a fire-retarding agent contained in said rolling material or coated on the outer surface of said rolling material; and



a combustion promoter coated on the inner surface of said rolling material.

4,679,576

VANITY CASE

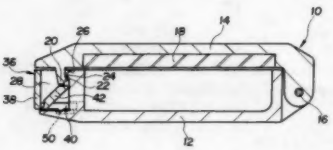
Yukitomo Yuhara, Abiko; Sumio Okojima, Yachiyo, and Tatsuo Ishikawa, Chiba, all of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,963

Claims priority, application Japan, Mar. 15, 1985, 60-36093[U]; Mar. 25, 1985, 60-41521[U]; Mar. 28, 1985, 60-43956[U]; Mar. 28, 1985, 60-43955[U]; Mar. 28, 1985, 60-43954[U]; Apr. 5, 1985, 60-49989[U]

Int. Cl.[4] A45D *33/00*

U.S. Cl. 132—82 R **20 Claims**



1. A vanity case comprising:

a receptacle member molded of plastic material for containing cosmetic material;

a cover member molded of plastic material;

said receptacle and cover members being hinged together at respective rear ends thereof;

a recess formed in a front end of said receptacle member and defined by an inner wall, a bottom surface and side walls;

a first latch tongue formed on said cover member;

a second latch tongue formed on said inner wall of said recess;

said first and second latch tongues being engaged with each other by snap action when said receptacle member is closed by said cover member, thereby maintaining sand cover member in a closed position with respect to said receptacle member; and

a push piece disposed within said recess and being movable therein rearwardly and forwardly, said push piece having a front wall and an arm integrally formed with said front wall through a thin flexible section, said flexible section permitting said arm to tilt with respect to said front wall, an upper surface of said arm being positioned closely adjacent a lower surface of said cover member in said closed position of said cover member, and a rear end of said arm being in contact with said inner wall of said recess and, upon rearward movement of said push piece, sliding upwardly on said inner wall to tilt said arm whereby said upper surface of said arm forces said lower surface of said cover member in upward and forward directions to release engagement between said first second latch tongues.

4,679,577

DEVICE FOR CLEANING TEETH

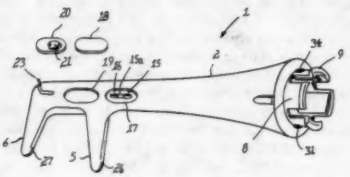
Phillippus J. Fourie, 34 Park Plaza, 21 Gregory Avenue, Melrose North, Johannesburg, Transvaal, South Africa

Filed Jun. 14, 1985, Ser. No. 744,855

Claims priority, application South Africa, Jun. 15, 1984, 84/4529

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—92 R **5 Claims**



1. A flossing device, comprising: an elongate floss carrying member (2) having a hollow interior and an open first end, an elongate locking member (3) inserted into the hollow interior of the floss carrying member through said open first end and coaxially rotatable therein, a second, opposite end of the floss carrying member defining two spaced, laterally extending tines (5, 6) supporting a span (25) of dental floss between outer ends thereof, the locking member having a first open ended slot (22) extending transversely through and across an inner end thereof and through which the dental floss passes in an operative position of the locking member, the floss carrying member having a second open ended slot (23) extending transversely through and across said opposite end thereof, wherein the first and second slots are in aligned registry in a threading position of the locking member relative to the floss carrying member such that an advanced length of floss may be introduced from the exterior of the device into inner, bottom portions of the slots by laying the floss crosswise in said open slot ends and advancing the floss deeper into the slots, whereafter the locking member may be rotated within the floss carrying member to wind the floss around the locking member and thereby tension the span between the tines.

4,679,578

VEHICLE CLEANING SYSTEM INCORPORATING NOVEL NOZZLE APPARATUS

Richard M. Miller, 2442 Harvest Dr., Conyers, Ga. 30208

Continuation-in-part of Ser. No. 594,934, Mar. 29, 1984, abandoned. This application Oct. 16, 1985, Ser. No. 788,098

Int. Cl.[4] B60S *3/04*

U.S. Cl. 134—123 **16 Claims**

14. Vehicle washing apparatus comprising:

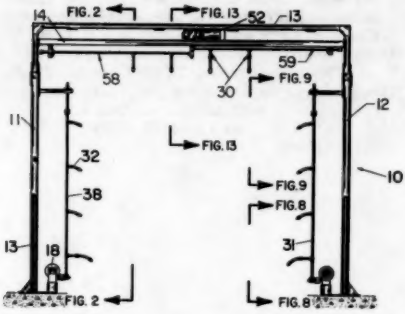
(a) water spray means comprising:

(1) a plurality of water spray nozzles arranged in spaced, overlapping vertical deployment;

(2) drive means for repetitively exciting said nozzles in a repetitive synchronous spray patttern without spray interference; and

(b) each of said water spray nozzles including a weighted

nozzle means for causing said nozzle, upon excitation by the drive means, to describe a uniform and substantially



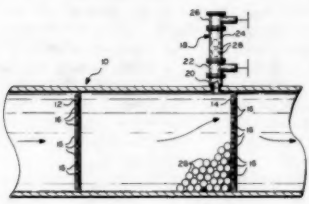
planar pattern of orbital movement relative to the surface of the vehicle.

4,679,579

METHOD AND APPARATUS FOR CONTROLLING THE PRESSURE OF GASES FLOWING THROUGH A CONDUIT

Bryan A. Megee, and James D. Whiteside, II, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 12, 1986, Ser. No. 828,482
Int. Cl.[4] G05D *7/00*
U.S. Cl. 137—13 **8 Claims**



1. A method of controlling the flow of a stream of gas flowing through a conduit during the flow of said gas stream through said conduit comprising disposing a plurality of pairs of generally spherically shaped objects within said conduit during the flow of said gas stream until the pressure of said gas stream downstream of said plurality of pairs of said objects is reduced to a desired value, each pair of objects being mutually secured together by a length of flexible connecting means.

4,679,580

VAPOR VENT CONTROL VALVE

Jeffrey E. Devall, Mt. Zion, and Ronald E. Reinke, Decatur, both of Ill., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Jun. 23, 1986, Ser. No. 877,603
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—39 **11 Claims**

1. A vapor vent control valve arrangement positioned between a fluid tank and a vapor recovery means comprising:

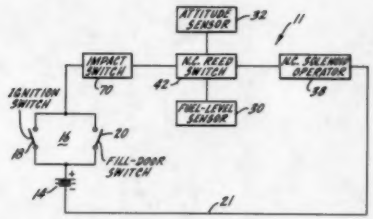
a housing defining a fluid passage including an entry port and an exhaust port providing a fluid flow path between said tank and vapor recovery means;

a solenoid valve means positioned to seal said exhaust port;

a relief valve means in said solenoid valve means to relieve a back pressure downstream of said solenoid valve;

a series circuit, including means for receiving electrical energy, a first switch means, a second switch means and said solenoid valve means;

a buoyant float in said fluid passage, operable to open said second switch means;



an attitude-responsive means, operable to move said buoyant float and thus open said second switch means;

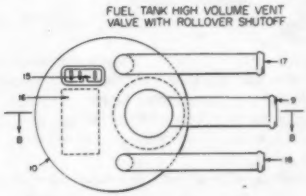
wherein actuation of said first switch means completes said series circuit and opens said solenoid valve means, thus providing fluid communication between said fluid tank and said vapor recovery means.

4,679,581

FUEL TANK VENT VALVE

William G. Mears, Kennett Square, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,513
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—43 **4 Claims**



1. A fuel tank vent valve comprising:

(a) a hollow, elongated housing adapted to be positioned at a vertical or near vertical position within a liquid fuel tank, said housing having at its upper end a valve seat communicating with the exterior of said tank and having at least one port communicating with the interior of said tank;

(b) a float slidably mounted within said housing and adapted to form a liquid-tight seal when seated against said valve seat of said hollow, elongated housing, and having an interior hollow channel communicating with the exterior of said tank when said float is seated against said valve seat and communicating with the port in said housing;

(c) a ball positioned within said interior hollow channel adapted to seal said interior channel when said float is positioned against said valve seat of (c), said ball having a density greater than that of the liquid fuel present or to be present in the fuel tank; and

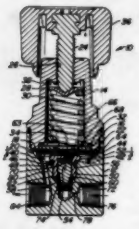
(d) means for urging said float, upwardly against said valve seat.

4,679,582

GAS PRESSURE REDUCING REGULATOR

Roger D. Zwicker, Arlington, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed May 9, 1986, Ser. No. 861,504
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—71 7 Claims



1. A gas pressure regulator for reducing high inlet gas pressure from a source to low outlet gas pressure comprising:

a. a body having an inlet for communication with a high pressure gas source and an outlet for communication with a low pressure application;

b. a cap on said body defining an ambient air chamber therein;

c. a diaphragm intermediate said cap and body and sealed therebetween;

d. a low pressure chamber defining a lateral wall in said body communicating with said diaphragm;

e. a high pressure chamber in said body communicating with said inlet;

f. a valve assembly disposed between said high pressure chamber and an outlet passage communicating with said outlet, said valve assembly being operable from a closed position to cut off flow from said inlet and from an open position wherein such flow is allowed from said inlet to said outlet; and

g. a diaphragm plate located intermediate said diaphragm and said valve assembly, said diaphragm plate being in contacting relation with said diaphragm and movable therewith but being otherwise free of attachment to said diaphragm, said diaphragm plate being dimensioned so as to substantially extend between said lateral wall,

h. means defining at least one opening in said diaphragm plate whereby pressure on the side of said diaphragm plate opposite said valve assembly is communicated to the opposite side of said diaphragm plate and thence to said diaphragm,

i. means defining grooves in said diaphragm plate extending from the center of said plate to a point adjacent to the periphery thereof, said grooves being adapted for directing gas from said valve assembly to said outlet,

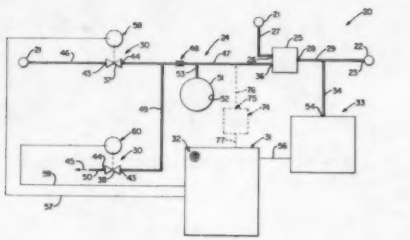
j. a spring plate located intermediate said ambient chamber and said diaphragm, said spring plate being in contracting relation with said diaphragm and having a centrally disposed aperture therein so as to permit said diaphragm to expand into said ambient chamber through said aperture to burst when a very large overpressure condition occurs in said high pressure chamber.

4,679,583

PNEUMATIC CONTROL SYSTEM, CONTROL MEANS THEREFOR AND METHOD OF MAKING THE SAME

William L. Lucas, Henrico County; Clarence M. Asbill, III, Richmond; Gerald L. Frank, and David M. Miller, both of Henrico County, all of Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 602,018, Apr. 19, 1984, Pat. No. 4,576,194.
This application Dec. 23, 1985, Ser. No. 812,367
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—84 10 Claims



1. In a pneumatic control system comprising a pneumatic source, a pneumatically operated device that produces an output, and a control means for interconnecting said source to said device, said control means having an input means interconnected to said source and an output means interconnected to said device, said control means having set point means for selecting a desired output of said device, said control means having valve means for controlling the interconnection between said input means and said output means so as to regulate the pressure value in said output means, said control means having regulating means for operating said valve means to tend to produce an outpout of said device that corresponds to said selected output of said set point means, the improvement wherein said regulating means has a silicon transverse voltage strain gauge means that senses said pressure value in said output means and operates said valve means so as to produce a pressure value in said output means that is substantially equal to a pressure value that will cause said device to produce said selected output, said control means comprising a relay means having said input means and said output means, said relay means having a pilot input and a valve unit for interconnecting said input means to said output means in relation to the pressure value in said pilot input at said valve unit, said valve means being interconnected to said source and to said pilot input whereby said regulating means operates said valve means to create said pressure value in said pilot input at said valve unit in relation to the sensed pressure value in said output means, said regulating means also having another silicon transverse voltage strain gauge means that senses the pressure value in said pilot input at said valve unit thereof.

4,679,584

SOFT SEAT Y-PATTERN CHECK VALVE

Harold E. Wolff, Alexandria, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 11, 1986, Ser. No. 895,075
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—269 10 Claims

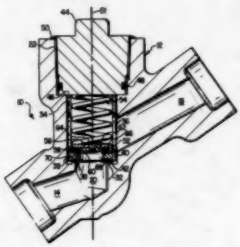
1. A check valve formed with a valve body having a flow passage, the valve body being an on-off Y-pattern valve body having a narrow annular seal seat to cooperate with a valve stem, the narrow annular seal seat unsuitable for use with a soft seal, said check valve comprising:

means for forming a permanent seal against the narrow annular seal seat, said means further forming a continua-

tion of the walls of the flow passage from the permanent seal along one direction of flow and defining an annular soft seal surface of surface area sufficiently greater than the narrow annular seal seat for sealing engagement with an annular soft seal;

an annular soft seal;

means for mounting a portion of the annular soft seal thereto



and for blocking fluid flow through the center of the soft seal; and

said mounting means responding to fluid flow in a first direction through the passage to move the soft seal away from the soft seal surface and responding to reverse flow through the passage to force the soft seal into sealing engagement with the soft seal surface to check reverse flow.

4,679,585

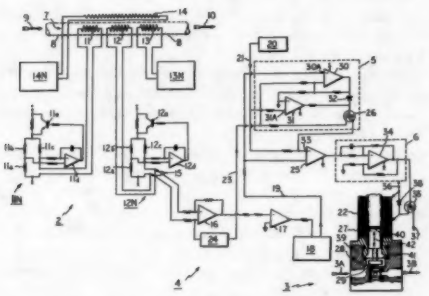
FLOWMETER-CONTROLLED VALVING

James H. Ewing, Brockton, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Filed Jan. 10, 1986, Ser. No. 818,216

Int. Cl.[4] F16K *31/02*

U.S. Cl. 137—486 **11 Claims**



1. Apparatus for controlling fluid flow, comprising a fluid-control valve having electrical winding means operable to regulate flow of fluid in a path by moving a valving member, means producing electrical flow signals characterizing actual amounts of fluid flow in said path, means producing electrical setpoint signals characterizing desired amounts of fluid flow in said path, controller means for energizing said winding means to regulate said fluid flow to agree with said desired amounts of said fluid flow responsive to electrical flow signals and setpoint signals appled thereto, a fast wake-up network having electrical switching means which may be turned on to apply to said controller means an artificial electrical setpoint signal which is larger than a predetermined relatively small threshhold setpoint signal and which will cause said controller means to energize said winding means strongly and thereby open said valve to commence or increase said fluid flow quickly, said network including means evaluating both said flow signals and said setpoint signals and turning on said switching means when said flow signals are smaller that a relatively small threshhold level and said setpoint signals are also in excess of said predetermined relatively small threshhold setpoint signal, and said controller means including means applying to said electrical winding means in control of said valving member electrical pulses having a predetermined relatively low-frequency repetition rate and having duty cycles which vary as required to move said valving member to regulate said flow of fluid, whereby rapid and free movement of said valving member are promoted by its being vibrated slightly at said rate and energized strongly by said fast wake-up network.

4,679,586

PILOT OPERATED RELIEF VALVE

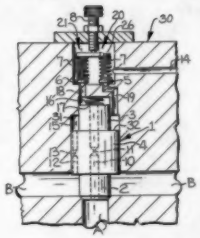
Hans-Peter Riedel, Steinhausen; Josef Zürcher, Edlibach, and Hubert Häussler, Neuheim, all of Switzerland, assignors to Beringer-Hydraulik GmbH, Neuheim, Switzerland

Continuation of Ser. No. 573,965, Jan. 26, 1984, Pat. No. 4,625,756. This application Apr. 4, 1986, Ser. No. 848,153

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302434; May 17, 1983, 3317879; Aug. 11, 1983, 3328988

Int. Cl.[4] G05D *16/00*; F16K *17/10*

U.S. Cl. 137—491 **11 Claims**



1. A pilot operated relief valve comprising

a housing having a bore therein, said bore having inner and outer ends and an outwardly facing annular shoulder intermediate its ends to define an inner cylindrical bore portion and an outer cylindrical bore portion which has a diameter greater than that of said inner bore portion,

a first fluid channel coaxially communicating with said outer end of said bore, and a second fluid channel radially communicating with said outer end of said bore,

a piston slideably mounted in said bore and comprising a cylindrical central portion which is closely received in said outer bore portion, and a cylindrical inner end portion which is coaxially fixed to said central portion so as to define an inwardly facing annular shoulder at the juncture thereof and which faces said annular shoulder of said bore, said inner end portion being closely received in said inner bore portion and having an inner end which faces said inner end of said bore, said piston further comprising a cylindrical outer end portion coaxially fixed to said central portion and having a diameter which generally corresponds to that of said inner end portion, said piston being slideably mounted in said bore for movement between a closed position wherein said outer end portion closes said first fluid channel, and an open position which permits communication between said first and second fluid channels, and wherein the space between the inner end of said bore and the inner end of said inner end portion of said piston defines a first control space, and the space between the outwardly facing shoulder of said bore and the oppositely facing shoulder of said piston defines a second control space,

first fluid canal means communicating between said first fluid channel and said first control space,

second fluid canal means communicating between said second channel and said second control space, and

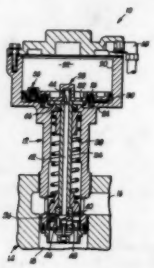
pressure release means operatively communicating with each of said first and second control spaces for releasing the pressure in each of said spaces upon the pressure therein exceeding a predetermined absolute amount, said pressure release means comprising a pressure relief outlet maintained at essentially zero pressure, a first relief duct communicating between said first control space and said pressure relief outlet, a second relief duct communicating between said second control space and said pressure relief outlet, adjustable pressure operated relief valve means operatively connected to each of said first and second relief ducts, a passageway extending between said first control space and said second fluid channel, and one way valve means disposed in said passageway for limiting flow to the direction from said first control space to said second channel upon a predetermined pressure difference being present therebetween.

4,679,587

LEAK DETECTOR WITH TWO STAGE PISTON CHAMBER

Klaus D. Jarr, Overland Park, Kans., assignor to The Marley-Wylain Company, Mission Woods, Kans.

Filed Oct. 14, 1986, Ser. No. 917,858
Int. Cl.[4] B67D *5/34*
U.S. Cl. 137—509 **8 Claims**



1. For use with a fluid conduit, a detector for sensing leakage of fluid from said conduit and for restricting the flow of fluid through said conduit whenever said leakage exceeds a certain, predetermined rate of flow, said detector comprising:

a housing defining a chamber;

a piston received in said chamber presenting a fluid pressure-receiving face and movable in said chamber in response to the pressure of fluid directed to said piston face;

means connected to said housing for communicating said fluid conduit to said housing chamber to enable movement of the piston in said chamber in accordance to the fluid pressure in said conduit;

valve means coupled to said piston for movement therewith and adapted for interposition in said fluid conduit,

said valve means being shiftable between a first position enabling a first volumetric rate of flow through said fluid conduit and a second position enabling a second volumetric rate of flow through said conduit which is greater than said first volumetric rate of flow; and

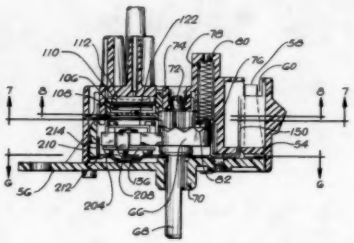
means for increasing the area of said fluid pressure-receiving face of said piston when said valve means is moved from said first position to said second position to enable greater compensation for thermal expansion and contraction of fluid in said fluid conduit by said piston when said valve means is in said second position.

4,679,588

COMBINATION ROTARY ELECTRICAL SWITCH AND VACUUM SELECTOR VALVE

Andrew F. Raab, Morton Grove, and Albert R. Cobb, III, Glenview, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Nov. 21, 1985, Ser. No. 800,558
Int. Cl.[4] F16K *33/44*; H01H *9/06*
U.S. Cl. 137—560 **14 Claims**



1. A combination electrical switch and vacuum selector valve, comprising

a casing,

rotary carriage means including shaft means rotatable in the casing,

such casing having bearing means for rotatably supporting such shaft means,

a vacuum valve carriage including a vacuum valve member movable along a linear path in the casing,

such casing having means forming a flat valve surface with valve ports extending out of the casing from such valve surface,

such casing including a linear guide channel for receiving and guiding the valve carriage for linear sliding movement with the valve member in sliding engagement with such surface,

the valve member including means for selectively affording communication between certain of the ports as the valve carriage is moved along the guide channel in the casing,

the valve carriage having a gear rack thereon,

the rotary carriage means including a pinion gear member meshing with the gear rack whereby rotary movement of the rotary carriage means produces linear movement of the valve carriage,

a plurality of switch contact means mounted in the casing,

and a switch contactor mounted on the rotary carriage means for movement therewith along a curved path,

the contactor being slidably engageable with the switch contact means for selectively affording electrical connections therebetween,

such switch contact means including at least one switch contact plate,

such casing and such switch contact plate having means for holding such switch contact plate in a stable position in such casing with such valve carriage slidably engaging such switch contact plate,

such switch contact plate comprising means for slidably retaining the valve carriage in the guide channel with the valve member in operative sliding engagement with the valve surface.

4,679,589

FLUID PRESSURE CONTROLLING SOLENOID VALVE

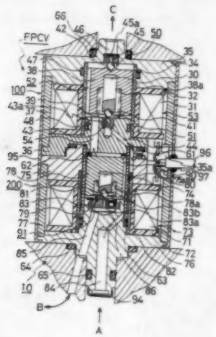
Masahiro Inden, Toyoake; Kazutaka Kuwana, Toyota; Nobuyasu Nakanishi, Toyota, and Noboru Noguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Sep. 19, 1986, Ser. No. 909,389

Claims priority, application Japan, Sep. 19, 1985, 60-207421

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—596.17 **6 Claims**



1. A fluid pressure controlling solenoid valve comprising

an intermediate member of a magnetic material having a cylindrical outer side surface and including a first valve seat disposed in its upper end face and located at the center of the cylindrical configuration, a first fluid path disposed adjacent to the first valve seat and extending therethrough from the upper to the lower end face thereof, and a second fluid path communicating with the fluid passage of the first valve seat and extending in a direction away from the center;

a first end member of a magnetic material having a cylindrical outer side surface and including a second valve seat disposed at the center of the cylindrical configuration and a first port communicating with the fluid passage of the second valve seat;

a second port communicating with the second fluid path;

a first cylindrical plunger enclosure member having its one end fastened to the upper end face of the intermediate member and its other end fastened to the first end member and having a plunger receiving space which communicates with the first and the second valve seat and the first fluid path, with the center axis of the space passing through the first and the second valve seat;

a first plunger of a magnetic material disposed within the first plunger enclosure member to divide its interior into a pair of spaces and including a first valve member disposed opposite to the first valve seat to close the opening thereof, a second valve member disposed opposite to the second valve seat to close the opening thereof and a bypass path which provides a communication between the pair of divided spaces;

first spring means for urging the first plunger in a direction along the center axis of the first plunger enclosure member;

a first electrical coil disposed around the first plunger enclosure member;

a first yoke of a magnetic material disposed laterally outside the first electrical coil and having its one end fastened to the intermediate member and its other end fastened to the first end member;

a second end member of a magnetic material having a cylindrical outer side surface and including a third valve seat disposed at the center of the cylindrical configuration in opposing relationship with the other surface of the intermediate member and a third port communicating with the fluid passage of the third valve seat;

a second, cylindrical plunger enclosure member having its one end fastened to the lower end face of the intermediate member and its other end fastened to the second end member and having a plunger receiving space which communicates with the first fluid path and the third valve seat, with a center axis of the space passing through the third valve seat;

a second plunger of a magnetic material disposed within the second plunger enclosure member to divide its interior into a pair of spaces and including a third valve member disposed opposite to the third valve seat to close the opening thereof and a bypass path which provides a communication between the pair of divided spaces;

second spring means for urging the second plunger in a direction along the center axis of the second plunger enclosure member;

a second electrical coil disposed around the second plunger enclosure member;

and a second yoke of a magnetic material disposed laterally outside the second electrical coil and having its one end fastened to the intermediate member and its other end to the second end member.

4,679,590

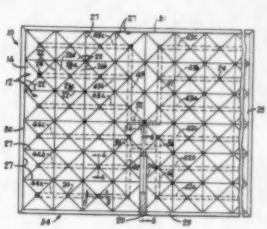
RECEPTACLE FOR COLLECTING FLUIDS

Patrick T. Hergenroeder, 48 W. Orange Street, Chagrin Falls, Ohio 44022

Continuation of Ser. No. 645,864, Aug. 31, 1984, abandoned. This application May 27, 1986, Ser. No. 869,441

Int. Cl.[4] A61M *1/00*

U.S. Cl. 137—602 **13 Claims**



8. A receptacle for collecting fluid comprised of a body of small thickness relative to its length and width and having an upper and lower surface, a plurality of shallow basins formed by the upper surface and channels in the lower surface communicating with the basins and isolated from communicating directly with an edge of the receptacle to constrain fluid to an area beneath the basins, and a discharge port communicating with a plurality of said channels.

4,679,591

SERVOVALVE DRIVE ELECTRONICS IMPROVEMENTS

Dale N. Maue, Minnetonka, and Richard A. Lund, Chaska, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 17, 1986, Ser. No. 840,402

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—624.13 **12 Claims**

1. A circuit for compensating an input signal to a servovalve having a spool, which servovalve spool has a response roll off characteristic with frequency, wherein the servovalve spool is driven in displacement by electric current signals acting through drive coils with an input error signal that is a dynamic signal, at a frequency (f) including:

first circuit means for providing a correction factor signal to

the error signal which is a function of the square of the frequency of the error signal;

means for summing the correction factor signal and the error signal with a stabilization signal that is a function of rate of displacement of the servovalve spool; and

means for driving coils of a servovalve in proportion to the output of the means to sum.

4,679,592

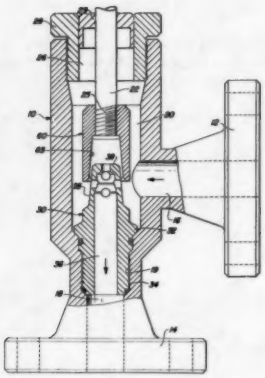
VALVE SEAT DESIGN TO REDUCE CAVITATION

C. Paul Lamb, Dallas, Tex., assignor to Teledyne Industries, Inc., Calif.

Filed Oct. 7, 1985, Ser. No. 785,067

Int. Cl.[4] F16K *47/16, 47/02*

U.S. Cl. 137—625.33 **15 Claims**



1. In a valve, a valve body having a valve chamber and inlet and outlet passages; a valve seat element in said chamber between said inlet passage and said outlet passage, said seat element having a bore formed therein; an end portion on said seat element closing said bore; a truncated conical seat surface on said seat element, said seat surface having a plurality of orifices extending therethrough and communicating with said bore; a valve element having a skirt portion and a pocket formed therein, said pocket having a truncated conical wall; and means movably securing said valve element in said valve chamber such that a portion of said seat element extends into said pocket in said valve element and said skirt portion of said valve element covers a portion of said plurality of orifices to form a plurality of tortuous flow paths.

4,679,593

SOLENOID VALVE

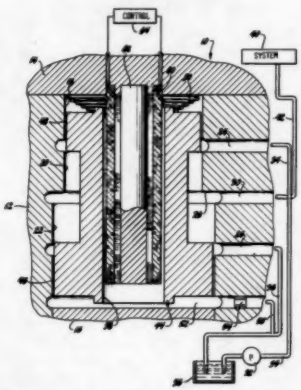
Robert K. Sanders, Lebanon, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1986, Ser. No. 908,737

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—625.65 **2 Claims**

1. A solenoid valve comprising: a valve body having a valve bore therein; a valve spool slidably disposed in said valve body and including two spaced valve lands formed on the outer circumference thereof, a fluid flow channel between said valve lands and a longitudinally extending central bore; a magnetic core member secured in said valve body and extending into said central bore of said valve spool; a solenoid coil disposed circumjacent said core member for substantially the entire length therof; spring means disposed between a portion of said valve body and one end of said valve spool for urging said valve spool in one longitudinal direction; pressure passage means formed in said valve body and communicating with said valve bore adjacent one of said valve lands; exhaust passage means formed in said valve body and communicating with said



valve bore adjacent the other of said valve lands; and control passage means formed in said valve body in fluid communication with said valve bore adjacent said fluid flow channel, said spring means being operable to urge the valve spool in said one longitudinal direction to selectively permit fluid communication between said control passage means and one of said pressure passage means and exhaust passage means, and said solenoid coil being selectively energized to cause a magnetic field urging said valve spool in the other longitudinal direction to selectively permit fluid communication between said control passage means and the other of said pressure passage means and said exhaust passage means.

4,679,594

TWO-CIRCUIT FLUID PRESSURE CONTROL VALVE

Stephen W. Fogg, Bath, England, assignor to Bendix Limited, Bristol

Filed Feb. 28, 1986, Ser. No. 834,684

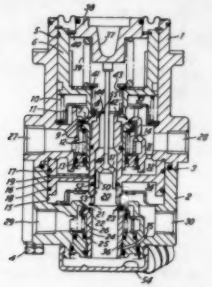
Claims priority, application United Kingdom, Mar. 21, 1985, 8507330

Int. Cl.[4] B60T *15/02*

U.S. Cl. 137—627.5 **4 Claims**

1. A two-circuit fluid pressure control valve having a housing containing an input member acting via resilient coupling means upon a first fluid pressure responsive member, a first double valve operable dependent upon the position of said first pressure responsive member to alternatively connect a first output port to an input port or to a vent, the pressure at said first output port acting on said first pressure responsive member in a sense to oppose the action of the resilient coupling means and also acting on a second pressure responsive member, a second double valve operable dependent upon the position of said second pressure responsive member to alternatively connect a second output port to an input port or to a vent, the pressure responsive member being subject to pressure at the second output port in a sense to oppose the action thereon of the pressure at the first output port and a reaction

linkage interconnecting said input menber and the second pressure responsive member for reducing hysteresis thereof in the housing, said reaction linkage being movable by said input



member relative to and independent of the movement of both said first fluid pressure responsive means and said first double valve.

4,679,595

DEVICE FOR CONTROLLING THE FLOW IN A PIPE SYSTEM

Jorgen M. Johannessen, Koge, Denmark, assignor to Jorgen Mosbaek Johannessen ApS, Denmark

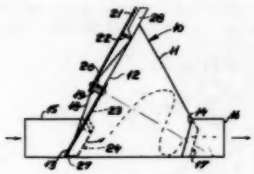
PCT No. PCT/DK84/00063, § 371 Date Feb. 28, 1985, § 102(e) Date Feb. 28, 1985, PCT Pub. No. WO85/00446, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 29, 1984, Ser. No. 711,503

Claims priority, application Denmark, Jun. 30, 1983, 3011/83

Int. Cl.[4] F15C *1/16*

U.S. Cl. 137—813 12 Claims



1. A device for controlling the flow of a liquid in a pipe system, comprising:

a housing having a curved side wall to form a vortex chamber therein, said housing having an inlet opening and an outlet opening oriented to allow free, unobstructed and substantially linear flow of said liquid through said housing from said inlet opening to said outlet opening in the absence of an angular velocity component in an inflowing liquid toward the housing side wall,

an adjustable guide vane mounted within said housing and adjacent said inlet opening, said guide vane being movable between the first position in which it is positioned substantially away from said inlet opening so as to impart no angular velocity component to the inflowing liquid toward such side wall, and operative positions in which it extends at least partially across said inlet opening to give said inflowing liquid controlled amounts of a velocity component having a direction which forms an angle with the direction of the inflowing liquid to move said inflowing liquid to said side wall to create a vortex flow of liquid in said chamber which creates a braking effect.

4,679,596

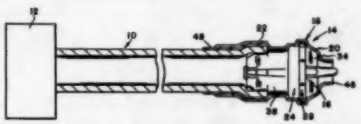
PRESSURE RELIEF VALVE

Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed Feb. 3, 1986, Ser. No. 825,167

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—853 7 Claims



1. A pressure relief valve cooperating with a tube which receives pressurized fluid, comprising a body coupled to an end of the tube, the body cooperating with the tube to define a fluid passage communicating with fluid pressure in the tube, a resilient sleeve engageable with the tube and the body to normally close the fluid passage, the resilient sleeve being responsive to fluid pressure above a predetermined level to open the fluid passage and permit fluid flow outwardly from the tube, the body defining a first surface cooperating with the resilient sleeve to initially open the fluid passage when the fluid pressure in the tube approaches the predetermined level, the body defining a second surface cooperating with the resilient sleeve to control further opening of the fluid passage in response to fluid pressure in the tube above the predetermined level, and the second surface defining a plurality of flanges defining a larger diameter than a diameter defined by the first surface.

4,679,597

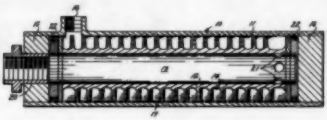
LIQUID PULSATION DAMPENING DEVICE

John Stein, Spokane, Wash., assignor to Kim Hotstart Mfg. Co., Inc., Spokane, Wash.

Filed Dec. 20, 1985, Ser. No. 811,646

Int. Cl.[4] F16L *55/02*

U.S. Cl. 138—26 14 Claims



1. A liquid pulsation dampening device, comprising:

a housing having a continuous cylindrical inner wall surface formed about a central longitudinal axis;

two end walls respectively sealed across the cylindrical inner wall surface of the housing at positions spaced longitudinally apart from one another along the axis;

a coaxial hollow longitudinal tube located within the housing, the tube having continuous inner and outer surfaces extending beween the two end walls, the outer surface defining a space separating it from the cylindrical inner wall surface of the housing;

a continuous helical fin formed integrally about the outer surface of the tube with the fin being extended radially outward to the cylindrical inner wall surface of the housing;

first port means leading between the inner wall surface of the housing and the outer surface of the tube for connection to a conduit adapted to lead to a source of liquid pulsations,

passage means for transferring liquid between the space separating the inner wall surface of the housing and the outer surface of the tube and the interior of the tube, the passage means being positioned at a single general location along the central longitudinal axis, the passage means

being longitudinally spaced from the location of the first port means;

second port means leading into the interior of the tube for connection to a conduit adapted to lead away from the source of liquid pulsations; and

the first port means, passage means, and second port means defining a flow path through which substantially all of the liquid entering and exiting the dampening device is caused to flow whereby liquid pulsations are dampened as a result of such flow.

4,679,598

SUBSEA PIPELINE BUNDLE

Trevor P. Jee, Seven Kings, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Mar. 17, 1986, Ser. No. 839,961

Claims priority, application United Kingdom, Mar. 20, 1985, 8507192

Int. Cl.[4] G05D *7/00*

U.S. Cl. 138—103 **4 Claims**

1. A tube bundle, suitable for the transportation of gas from a subsea wellhead, which tube bundle comprises (a) an insulated external casing, (b) at least one internal production line, and (c) an internal heating tube for carrying a heating medium through the bundle to its wellhead end for discharge into the casing and return therethrough, the heating tube having a tapered or stepped layer of insulating material with the insulation increasing in thickness in the direction away from the wellhead.

4,679,599

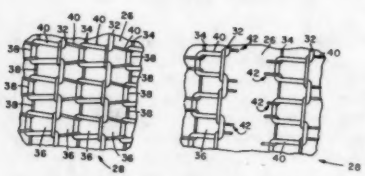
SAFETY HOSE

Mark A. Newberry, Lakewood, and Dennis C. Kemper, Aurora, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Feb. 8, 1985, Ser. No. 700,144

Int. Cl.[4] F16L *55/00*

U.S. Cl. 138—104 **6 Claims**



1. In a hose of the type having an elastomeric tube, a twined reinforcement encircling the tube and an elastomeric cover encircling the tube and reinforcement, the improvement comprising:

a knit reinforcement comprising intermittent leads of a first yarn and a second, tensionally weaker yarn alternatively knitted together with knit stitched loops that each have a helically oriented component and a longitudinally oriented component in relation to the tube and wherein a cumulative tensile strength of the longitudinally oriented loop components is substantially less than a cumulative tensile strength of the helically oriented loop components such that some of the loops of the second yarn define a means to break and permit substantial elongation of the hose without tube rupture.

4,679,600

HIGH TENSILE STRENGTH REMOVABLE HOSE COVERING

Robert C. Dougherty, Tucson, Ariz., assignor to Durodyne, Inc., Tucson, Ariz.

Filed Sep. 9, 1985, Ser. No. 774,019

Int. Cl.[4] F16L *11/08*

U.S. Cl. 138—128 **19 Claims**

1. A high tensile strength removable hose covering for surrounding and protecting an inner hose and to impart high tensile strength in the longitudinal direction to the combined inner hose and removable hose covering for the full length of the hose covering between hose couplings or stationary standards, the removable hose covering comprising:

a separable closure mechanism having a lockable first part and second part;

means connecting between said closure mechanism first part and second part; and

a high tensile strength longitudinal member adapted to be attached to associated hose couplings or stationary standards, said high tensile strength longitudinal member operably connected to said means connecting between said first part and second part of said closure mechanism.

4,679,601

METHOD AND AN APPARATUS FOR ACCELERATING AIR OR GAS EXCHANGE

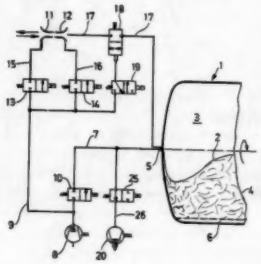
Alfred Schmid, Schöfflisdorf, Switzerland, assignor to Bucher-Guyer AG, Niederweningen, Switzerland

Continuation of Ser. No. 575,823, Feb. 1, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,164

Claims priority, application Switzerland, Mar. 31, 1983, 1803/83

Int. Cl.[4] B30B *9/22*; B65B *3/00*

U.S. Cl. 141—4 **17 Claims**



1. A cyclical method for accelerating air or gas exchange in a press container having a pressure chamber separated from a pressing space by a membrane with the aid of compression means, discharge means, and pressure and vacuum pumping means, comprising

operating said compression means to produce compressed air or gas,

operating said pressure pumping means to mix air or gas from an external source with said compressed air or gas from said compression means,

introducing said mixed air or gas through a pump conduit into said pressure chamber to move said membrane against solid material in said pressing space,

closing off said pump conduit from said pressure chamber,

introducing compressed air or gas from said compression means through a main conduit into said pressure chamber thereby to exert pressure on said solid material and to separate liquid from said solid material,

closing off said main conduit from said pressure chamber,

opening said pump conduit, and

operating said compression means and said vacuum pumping means in conjunction with each other to discharge air or gas from said pressure chamber thereby to move said membrane away from said solid material.

4,679,602

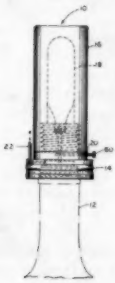
REMOVABLE DEVICE FOR REPEATEDLY PRESSURIZING A CONTAINER

Glenn E. Hollis, 3621 Belcher Dr., Tampa, Fla. 33609, and Craig E. Hollis, 3520 Cleveland Heights Blvd., Lakeland, Fla. 33903

Filed Jul. 27, 1982, Ser. No. 402,347

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—19 **1 Claim**



1. A filling device for filling a container with a pressurized gas from a cartridge having a face portion, comprising in combination:

a base for connection to the container,

a housing including a first cavity operatively connected to said base for housing the cartridge containing the pressurized gas;

a fluid passageway extending from said housing through said base for fluid communication with the interior of the container;

means for puncturing the face of the cartridge to permit the gas contained therein to flow through said fluid passageway into the container; and

valve means for controlling the flow of gas through said fluid passageway;

wherein said valve includes a shaft which extends through said base to engage said fluid passageway;

wherein said shaft includes a hole which is aligned with said fluid passageway when said valve is in the "on" position and is misaligned with said fluid passageway when the valve is in the "off" position;

further including a pressure gauge for sensing the pressure on the gas contained within the container;

wherein said pressure gauge includes an indicator rod to provide a visual indication of the pressure of the interior of the container;

wherein said indicator rod of said pressure gauge is color coded to indicate over-charging, under-charging, and the desired pressure of the container.

4,679,603

FILLING MACHINE FOR FILLING LIQUID UNDER COUNTERPRESSURE

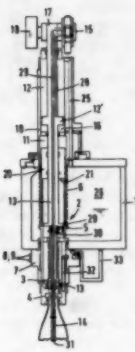
Friedrich Rademacher, Kamen-Südkamen; Siegmar Sindermann, Kamen-Heeren, and Rolf Süshardt, Waltrop, all of Fed. Rep. of Germany, assignors to Holstein und Kappert GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,518

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446501

Int. Cl.[4] B67C *3/06*

U.S. Cl. 141—39 **8 Claims**



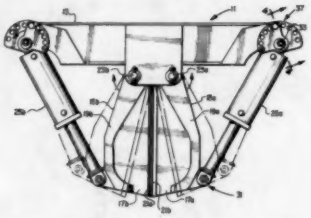
1. Filling machine for filling liquid into a container under counterpressure comprising a filling machine vessel, a filling valve in communication with said vessel, said filling valve including a support body, an upwardly extending return gas tube located in and extending through said support body and having a lower end, valve means in said support body, an upwardly extending piston-cylinder unit for operating said filling valve and with said unit extending through said support body, wherein the improvement comprises a generally vertically movable container centering member displaceable between an upper release position spaced from the container to be filled and a lower centering position engaging the container to be filled with said filling valve extending from said vessel to said centering member, means for moving said centering member between the release position and the centering position and for moving the lower end of said return gas tube into the container to be filled downwardly from said centering member, a piston member in said piston-cylinder unit enclosing said return gas tube and displaceable relative to said return gas tube in the centering position of said centering member for opening said filling valve for supplying liquid from said filling machine vessel, said means for moving said centering member arranged to close said filling valve by lifting said piston member when the liquid introduced from said pressure vessel through said filling. valve into the container reaches the level of the lower end of said return gas tube while said centering member remains in the centering position, so that by lifting said piston member an increased volume communicating with the container is established and the return gas tube empties the liquid therein into the container and, with the shutoff of the return gas connection to said vessel, a pressure release of the space within the container to atmospheric pressure takes place.

4,679,604

SHEAR BLADE CUTTING DEVICE WITH ADJUSTING BLADE ALIGNMENT COMPENSATOR

D. Franklin Howeth, 2901 St. Louis Ave., Fort Worth, Tex. 76110

Filed May 6, 1986, Ser. No. 860,136
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—34 E **13 Claims**



1. A cutting apparatus, which comprises:

a frame assembly;

a pair of shear blades mounted to said frame assembly, with at least one of said shear blades being pivotally mounted to said frame assembly and movable with respect to the other of said shear blades in pincer-like fashion;

actuator means connected between said frame assembly and said pivotally mounted blade for moving said pivotally mounted shear blade with respect to said other shear blade;

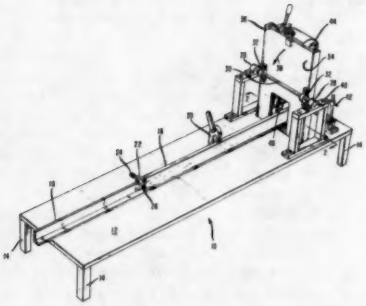
and means for adjusting the connection of said actuator means to one of said frame assembly or said pivotally mounted shear blade to adjust the movement of said pivotally mounted shear blade with respect to said other shear blade.

4,679,605

FENCE MACHINING DEVICE

Salvatore Picciuto, Piscataway, N.J., assignor to Mar-Sal Machine Co., Inc., Greenbrook, N.J.

Filed Jun. 26, 1986, Ser. No. 878,618
Int. Cl.[4] B27C *5/00*
U.S. Cl. 144—117 R **6 Claims**



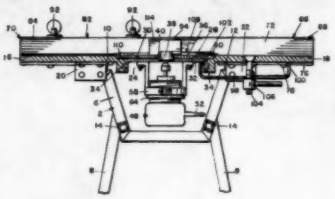
1. A fence post machining device comprising a workpiece supporting table, a plate, said plate hingably secured to said table, a carriage, means to slidably engage said carriage to said plate, said means to slidably engage including a rack, said rack being secured to said plate, a pinion, said pinion being mounted for rotation on said carriage, an operating lever, one end of said operating lever being coupled to said pinion, whereby manually manipulating said operating lever causes the rotation of said pinion and alternately and selectively displaces the longitudinal axis of said pinion along the length of said rack, a cutter, said cutter mounted for rotation on said carriage, means to selectively alternately slidably displace said carriage relative to said plate and to pivot said carriage about a line extending parallel to the plane defined by said work supporting surface, means to limit the amount of pivoting of said plate relative to said work surface, means to limit the amount of slidable translation of said plate to said carriage, means to removably secure a workpiece to said workpiece supporting surface.

4,679,606

ROUTER TABLE

Alvin L. Bassett, 10410 SE. Raymond Ave., Portland, Oreg. 97266

Filed Jul. 7, 1986, Ser. No. 882,254
Int. Cl.[4] B27C *9/00, 5/00*
U.S. Cl. 144—134 A **8 Claims**



1. A router table comprising:

a. a table having a planar top surface and comprising a pair of coplanar slabs spaced apart to present a parallel-sided gap therebetween,

b. a fence disposed along one edge of said table and rising above the top surface thereof whereby a work piece may be guided thereby in a straight line across said table top, the gap between said slabs being disposed at right angles to said fence,

c. a carriage having its upper surface coplanar with said slabs mounted slidably between said slabs for movement in said gap at right angles to said fence, and

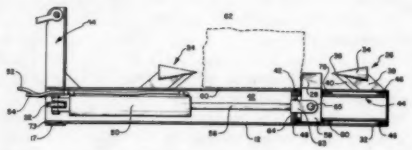
d. a router including a drive unit and a router bit rotatable on a vertical axis, said router drive unit being mounted beneath said carriage and said router bit projecting upwardly through an aperture of said carriage not larger than required to permit free rotation of the bit, the top surface of said carriage extending substantial distances in all directions from said bit aperture to provide solid support for the work piece in the area surrounding said bit.

4,679,607

LOG SPLITTER

Terry Bradley, Box 12, Howell, Utah 84316

Filed Apr. 4, 1986, Ser. No. 848,743
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A **43 Claims**



43. A double-action hydraulic log splitter, comprising:

a hollow, cylindrical support frame having formed therein an elongated slot parallel the axis of the support frame;

first and second cleaving blades mounted at fixed positions in a confronting relationship on the exterior of the support

frame at opposite ends of the elongated slot, the first and second cleaving blades each comprising:

an elongated conical body portion having a vertex directed toward the other of the cleaving blades and a longitudinal axis parallel the axis of the support frame; and

a generally planar footing having a tapered, knife-like edge oriented toward the other of the cleaving blades, said footing being attached to the body portion and defining a plane containing all points on longitudinal axis thereof;

a hollow, cylindrical carriage slideably mounted within the support frame for reciprocating motion substantially therewithin, said carriage being provided on opposite sides thereof with means defining a primary and a supplementary coupling slot;

a log-impelling block on the exterior of the support frame having a depending coupling tongue for insertion through the elongated enclosure in the support frame and through the primary and supplementary coupling apertures in the carriage, said log-impelling block releasably secured to the carriage and movable therewith between the first and second cleaving blades; and

two-way hydraulic cylinder means mounted within the support frame at one end of the carriage and having a clevis releasably secured to the coupling tongue between the primary and supplementary apertures in the carriage for propelling the carriage and driving the log-impelling block between the first and second cleaving blades, whereby a log placed against the support frame between the log-impelling block and either of the cleaving means is split by being forced onto that cleaving means.

4,679,608

VEHICLE TIRE CHAIN

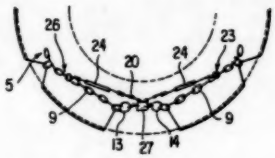
Ferdinand Jeindl, Graz, Austria, assignor to Steirische Kettenfabriken Pengg-Walenta KG, Graz, Austria

Filed Jan. 22, 1985, Ser. No. 693,685

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401971

Int. Cl.[4] B60C *27/12*

U.S. Cl. 152—213 A **16 Claims**



1. In a vehicle tire chain having a openable and closable inner and outer support engaging, in a mounted state of the chain, respective inner and outer sides of a vehicle tire, a plurality of runner chains each secured to the inner and outer supports and straddling, in the mounted state of the chain, a running face of the tire, the improvement wherein said outer support comprises

(a) a first part supporting said runner chains jointly with said inner support; said first part having first and second ends situated adjacent one another in the mounted state of the chain;

(b) first and second deflecting members secured to said first and second ends, respectively of said first part; and

(c) a second part comprising a closing linkage means for closing said first part under tension in the mounted state of the chain and during normal operation thereof; said closing linkage means including

(1) opposite first and second ends;

(2) first and second hooks secured to said first and second ends, respectively, of said closing linkage means and releasably attached to said first part of said outer support in the mounted state of said chain; said closing linkage means being passed glidingly over said first and second deflecting members and being deflected by more than 90° by each of said deflecting members and said closing linkage means having two end portions crossing one another in said mounted state; and

(3) separate elastic tensioning members situated adjacent said first and second ends of said closing linkage means; each elastic tensioning member exerting a resilient force on both said first and second deflecting members from different directions to expose each deflecting member to two resilient forces from two directions by means of said closing linkage means.

4,679,609

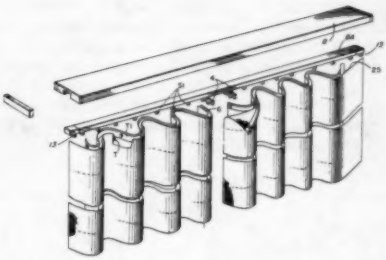
THERMALLY PROTECTIVE DRAPERY CONSTRUCTION FOR WINDOWS, SLIDING GLASS DOORS, GLASS WALL PANELS AND THE LIKE

Frank E. Bateman, 42 George St., Littleton, Mass. 01460

Continuation-in-part of Ser. No. 539,033, Oct. 5, 1983, which is a continuation-in-part of Ser. No. 318,666, Nov. 5, 1981. This application Jun. 24, 1986, Ser. No. 880,331

Int. Cl.[4] A47H *5/032, 13/12, 23/01*

U.S. Cl. 160—124 **17 Claims**



1. A thermal drapery construction, comprising:

(a) a retaining rod for locating drapery material adjacent to a wall surface;

(b) an inner panel of heat shielding fabric and an outer panel of drapery material spaced apart from each other;

(c) carrier members having opposing fasteners on their opposite sides and having a depth of at least 0.25 inch, the carrier members being interconnected by cords and mounted on the rod in sliding contact slidably supporting the panels in reversely folded relationship below the rod;

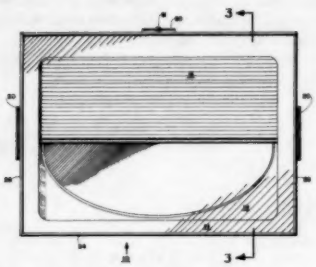
(d) fasteners secured in spaced apart relationship along the upper edge of each panel for fastening each panel to the carrier members, the fasteners along the upper edge of one panel being spaced a predetermined equal distance and the fasteners along the upper edge of the other panel being spaced alternating distances longer and shorter than the equal distance to compensate for different arcuate lengths of folds of the panels and thereby maintain a distance between panels at least 0.25 inch thereby providing an airspace between panels for insulation; and

(e) separator means the same thickness as the airspace, located between the inner and outer panels, for maintaining the critical airspace at lower portions of the two panels.

4,679,610
MODULAR WINDOW INSERT WITH COLLAPSIBLE SHADE

Mike Spraggins, 13201 Stairock, San Antonio, Tex. 78248

Filed Jan. 31, 1986, Ser. No. 824,679
Int. Cl.[4] E06B *3/32*
U.S. Cl. 160—107 8 Claims



1. A modular window insert unit comprising:

means defining a curved inner window pane formed of impact resistant plastic;

means defining a curved outer window pane formed of impact resistant plastic;

a curved frame assembly securing said inner and outer window panes in spaced, generally parallel relation;

collapsible shade means comprising a plurality of collapsible tubes formed from a compressed polymer material, said tubes being attached along complementary edges, each of said tubes being substantially collapsed when said shade is in a first position, and each of said tubes having a substantially hexagonal cross-section when said shade is in a second position, said shade being secured in said frame assembly between said inner and said outer panes;

actuator means for moving said collapsible shade from said first position to said second position.

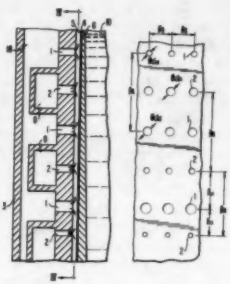
4,679,611
COOLING APPARATUS FOR BELT TYPE CONTINUOUS CASTING MACHINE

Takashi Yoshida; Tomoaki Kimura; Tadashi Nishino, all of Hitachi, and Sadayuki Saito, Chiba, all of Japan, assignors to Hitachi, Ltd. and Kawasaki Steel Corporation, both of Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 802,722
Claims priority, application Japan, Nov. 28, 1984, 59-251380
Int. Cl.[4] B22D *11/124*
U.S. Cl. 164—431 14 Claims

1. A cooling apparatus for a belt type continuous casting machine comprising:

a belt mold having a pair of movable belts and a pair of side members, a cooling pad disposed adjacent to the movable belt for forming a water film portion therebetween and having a plurality of inlet and outlet ports for running cooling water into the water film portion therethrough and wherein at least one of diameters of the inlet and

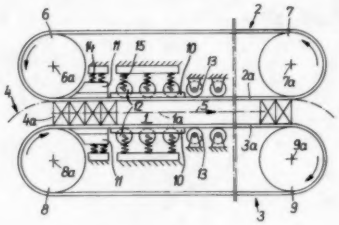


outlet ports and a vertical distance between each inlet port and the outlet ports adjacent thereto is varied.

4,679,612
GUIDE ASSEMBLY FOR A TWIN-BELT CONTINUOUS CASTING MOLD

Gerd Artz, Ratingen; Dieter Figge, Essen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,706
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444689
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—431 5 Claims



1. In a twin-belt continuous casting mold including an elongated mold chamber defined by top, bottom and opposite lateral chamber walls travelling codirectionally in a casting direction; said mold chamber having a width dimension oriented perpendicularly to said casting direction; said top and bottom walls being constituted by a length portion of respective upper and lower endless casting belts supported by respective upper and lower upstream and downstream end drums as viewed in the casting direction; said mold chamber having an entrance adjacent the upstream end drums and an outlet adjacent the downstream end drums; said opposite lateral chamber walls being constituted by a length portion of respective segmented side dams; a guide assembly for the casting belts; said guide assembly including a plurality of support rollers arranged serially parallel to the casting direction and engaging each casting belt along said mold chamber, additional ribbed supports engaging each casting belt in a zone between a respective said upstream end drum and a respective first said support roller as viewed in the casting direction from said upstream end drums; said additional ribbed supports engaging each casting belt in a direction transverse to said casting direction for supporting said casting belts in a zone of said mold chamber

and said side dams; the improvement wherein said support assembly comprises a first resilient holding means for positioning each said additional support and resiliently urging it into engagement with a respective said casting belt; each said additional ribbed support being constituted by a support carrier; said support rollers forming a first and a second group of support rollers; said first group of support rollers being situated in a zone of said entrance adjacent the respective said support carrier downstream thereof; a second resilient holding means for positioning each said support roller of said first group in a zone between said side dams for resiliently urging each said support roller of said first group into engagement with a respective said casting belt; said first and second resilient holding means comprising a plurality of rockers; a separate one of said rockers carrying said support carriers and the support rollers of said first group; each rocker having a stationarily supported horizontal pivot means for providing a swinging motion for each said rocker in a vertical plane; said second group of support rollers being situated downstream of said first group of support rollers and being rigidly held; each said roller of said first and second groups having a supporting portion provided with an arcuate outer contour being convex towards said mold chamber and being oriented parallel to said width dimensions; each said supporting portion being shorter than said width dimension; further comprising side dam support means extending parallel to said casting direction and flanking said support rollers of said first group and engaging a respective said casting belt in alignment with said side dams.

4,679,613

METHOD OF AND APPARATUS FOR CASTING A COMPOUND METAL BAR

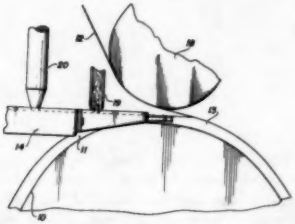
E. Henry Chia, and Ronald D. Adams, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation of Ser. No. 446,128, Dec. 2, 1982, Pat. No. 4,566,524. This application Jan. 8, 1986, Ser. No. 817,197

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] B22D *11/06, 11/18, 19/08*

U.S. Cl. 164—453 **12 Claims**



1. Apparatus for continuously casting a compound metal bar, having a core metal encased by a clad metal comprising:

a continuous casting machine having a continuously advancing mold;

means for continuously substantially horizontally pouring a first molten metal into the mold of the continuous casting machine from the side wall of a tundish; and

means for continuously substantially horizontally discharging a second molten metal into said mold at a point submerged beneath the surface of the first molten metal, whereby said second metal solidifies to form the core metal and the first metal solidifies to form the clad metal of the compound metal bar with substantially no oxidation at the interface between the two molten metals.

8. A method of continuously casting a compound metal bar having a core metal encased in a clad metal comprising the steps of:

continuously advancing a metal casting mold;

continuously pouring a first molten metal into said mold;

continuously discharging a second molten metal into the mold at a point submerged beneath the surface level of the first molten metal;

providing means for preventing metal turbulence in said metal casting mold as said first and second molten metals are continuously poured into said mold so that substantially no mixing of said metals occurs at a transition zone between the two and a unitary metal matrix is formed and said first and second metals remain substantially distinct metallurgical entities with substantially no oxidation at the interface between the two metals, and

continuously solidifying said firsta nd second metals to form said compound metal bar.

4,679,614

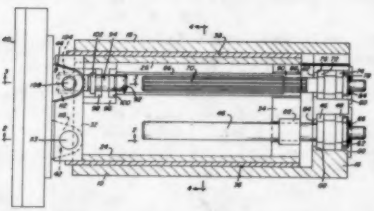
APPARATUS FOR SIGNIFICANTLY DECREASING UNDESIRED VARIATION IN THE ALIGNMENT OF ADJUSTABLE CONTINUOUS CASTER MOLD WALLS

John A. Grove, Sugarcreek Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1985, Ser. No. 791,636

Int. Cl.[4] B22D *11/04, 11/10*

U.S. Cl. 164—436 **6 Claims**



1. In a continuous caster mold, said mold having broad and narrow mold walls, means for adjustment of the spacing and angular alignment of the narrow walls with respect to a casting direction, and a pair of means pivotally connecting each narrow wall to the adjustment means at spaced locations adjacent opposed ends of said wall in the casting direction,

the improvement in said mold for increasing the rigidity of said adjustment means which is characterized by:

said adjustment means including an elongated housing having an opening in one narrow end thereof, an elongated member slidably mounted in the housing and extending outwardly through said opening in the housing, said pair of pivotal connections connecting the mold wall to said member, means for moving said slidable member longitudinally back and forth in the housing, and means extending longitudinally through the housing and said slidable member and connected to the rotatable member of one of said pair of pivotal connections for adjusting the angular alignment of said mold wall by tilting said wall about the axis of the other of the pivotal connections in said pair.

4,679,615

METHOD AND APPARATUS FOR HEATING AND/OR COOLING OBJECTS SIMULTANEOUSLY AT DIFFERENT PRESELECTED TEMPERATURES

Avinoam Livne, Beersheva, Israel, assignor to Advanced Products Ltd., Beersheva, Israel

Filed Mar. 1, 1985, Ser. No. 707,152

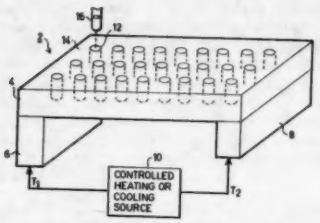
Claims priority, application Israel, Mar. 2, 1985, 71131

Int. Cl.[4] F28F *13/00*

U.S. Cl. 165—1 **10 Claims**

1. A method of heating and/or cooling a plurality of objects simultaneously at a plurality of different preselected temperatures, comprising: establishing a constant temperature gradient over a length of a heat-conductive member by producing a

predetermined temperature difference between two spaced points of said heat-conductive member; bringing said plurality of objects into heat-exchange relationship with predetermined locations of said temperature gradient according to the prese-



lected temperatures to which the respective object is to be heated or cooled; and maintaining said predetermined temperature difference at said two spaced points of the heat-conductive member during the heating or cooling of said objects.

4,679,616

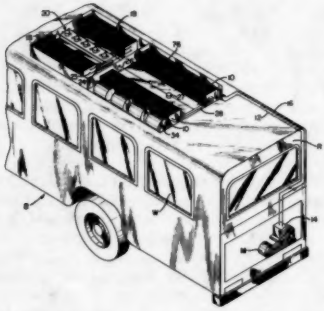
ROOF-MOUNTED AIR CONDITIONER SYSTEM HAVING MODULAR EVAPORATOR AND CONDENSOR UNITS

Houshang Ferdows, Boulder, Colo.; Martin Krug, Möglingen, and Paul R. Bihl, Ditzingen, both of Fed. Rep. of Germany, assignors to Suetrak U.S.A., Inc., Lamar, Colo.

Continuation of Ser. No. 565,026, Dec. 20, 1983, Pat. No. 4,607,497. This application Apr. 28, 1986, Ser. No. 832,971

Int. Cl.[4] B60H *3/00*

U.S. Cl. 165—43 **4 Claims**



1. In an air conditioner system mounted on the roof of a bus wherein said bus has an upper relatively flat roof, a ceiling spaced beneath said roof with a return air inlet disposed in said roof intermediately between air circulating ducts which extend between said roof and ceiling for directing conditioned air into the interior of said bus, there being compressor means to draw refrigerant from evaporator coils and to discharge said refrigerant under pressure, the improvement comprising:

a modular condensor unit having a first shallow, generally rectangular housing including a base panel conforming to the contour of said roof, mutually opposed sidewalls and end walls and a cover, elongated condensor coils extending horizontally within said housing to receive the refrigerant under pressure from said compressor means, and air circulating means for directing air across said condensor coils between said condensor coils and discharging the air through an air outlet in said cover;

a modular evaporator unit having a second outer shallow, generally rectangular housing including a base panel conforming to the contour of said roof, mutually opposed sidewalls and front and rear end walls and a cover, means for attaching said base panel to said roof whereby said return air inlet and said air circulating ducts are in communication with the interior of said evaporator housing, said evaporator coils mounted on opposite sides of said return air inlet, and elongated heater coils between each of said evaporator coils and opposite sidewalls of said housing, a fresh air inlet in one said end wall of said evaporator housing, and evaporator air blower means in said evaporator housing for directing air through said return air inlet and fresh air inlet simultaneously across said evaporator coils and heater coils preliminary to discharge through said air circulating ducts into the interior of said bus; and

said modular condensor unit and said modular evaporator unit mounted independently of one another on the roof of the bus, and refrigerant lines extending between said condensor unit and said evaporator unit including means for conducting the refrigerant from said condensor coils to said evaporator coils.

4,679,617

CEILING OR WALL UNIT

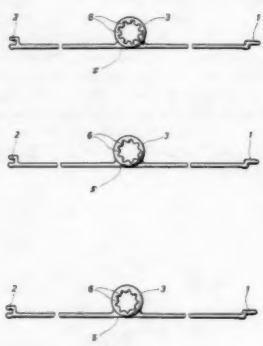
Erick C. V. Keldmann, Bellinge, Denmark, assignor to Elpan, Aps, Odense M., Denmark

Filed Feb. 6, 1985, Ser. No. 698,807

Claims priority, application Denmark, Feb. 6, 1984, 516/84

Int. Cl.[4] F28F *1/32*

U.S. Cl. 165—56 **1 Claim**



1. Heat transfer apparatus comprising:

a plurality of integral extruded metal modules, each said module comprising an elongated, substantially circular pipe and an elongated, generally planar and rectangular plate;

a pair of elongated manifolds extending transversely of said modules at respective opposite ends thereof;

a plurality of pipe stubs interconnecting said manifolds with the pipes of said modules; and

means disposed on said manifolds for supporting said apparatus;

each said substantially circular pipe having a predetermined outer diameter and having an inner diameter of the order of 8 mm, and being provided with longitudinal inner ribs;

each said plate having first and second elongated, parallel edges having means formed thereon for structural connection of adjacent plates to one another;

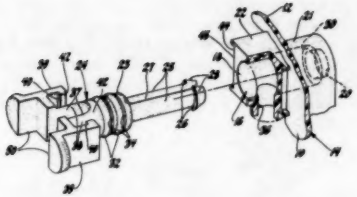
each said plate having its associated pipe attached to one side thereof and having on its opposite side a surface comprising a pair of elongated, substantially planar portions extending the length of the plate, and a plurality of longitudinally-oriented ribs disposed therebetween.

4,679,618

DRAINCOCK AND DRAIN HOLE FOR A LIQUID VESSEL

Frank J. Farkas, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1986, Ser. No. 930,110
Int. Cl.[4] F16F 1/34
U.S. Cl. 165—71 2 Claims



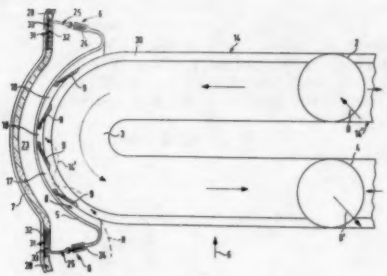
1. A draincock and drain hole for a liquid vessel such as a motor vehicle radiator characterized by the hole including a stepped cylindrical bore with a large diameter portion that opens to the exterior of the vessel and a small diameter portion that opens to the interior of the vessel, the draincock having a cylindrical body that is receivable with a slip fit in the large diameter bore portion, at least one cantilever retaining arm extending from one end of the cylindrical body having a hook and a ramp at the end thereof, the ramp arranged to contact with a radial step between the bore portions on inwardly forced movement of the draincock to deflect the respective arm inward to allow the hook and thereby the arm to pass through the small diameter bore portion and whereafter the hook upon clearing the small diameter bore portion allows the arm to resume its normal state while extending through but not blocking the small diameter bore portion and positioning the hook for contact with the vessel about the hole to prevent removal of the draincock from the hole, seal means mounted on the cylindrical body for preventing leakage therepast in the large diameter bore portion, the vessel having a hole intersecting with the large diameter bore portion for connecting same with the exterior of the vessel, the length of the retaining arm measured from the cylindrical body to the hook being determined so that the draincock while remaining retained by the hook is movable between an open position uncovering the hole to the large diameter bore portion and through the small bore portion past the retaining arm to the interior of the vessel and a closed position blocking the hole with the cylindrical body and positioning the seal means between the radial hole and the small diameter bore portion to sealingly close the drain hole, and at lest one cantilever locking arm extending from the other end of the cylindrical body having a locking hook and a lock engaging ramp, a detent formed on the exterior of the vessel, the lock engaging ramp being arranged to contact with the detent on inwardly forced draincock movement to deflect the locking arm outward so that the locking hook clears the detent and whereafter the locking arm resumes its normal state to position the locking hood to contact the detent to lock the draincock in its closed position and whereafter the locking arm is manually deflectable outward to release from the detent to allow movement of the draincock to its open position while remaining retained in the stepped bore by the retaining arm.

4,679,619

HEAT EXCHANGERS HAVING A TUBE MATRIX IN A HOUSING

Bernhard Wöhrl, Gauting, and Alfred Jabs, Gröbenzell, both of Fed. Rep. of Germany, assignors to MT Motoren-und Turbinen Union Munchen GmbH, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,468
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514377
Int. Cl.[4] F28D 7/06; F28F 9/22
U.S. Cl. 165—81 15 Claims



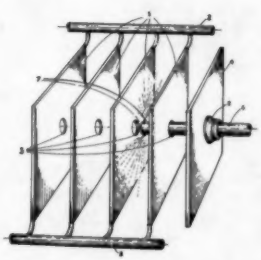
1. In a heat exchanger having a plurality of spaced U-shaped tubes arranged in a matrix and disposed in a housing for the flow of hot gases around the tubes for heat exchange with a fluid conveyed in said tubes, said housing having a wall surrounding the curved U-portions of the tubes of the matrix in spaced relation, the improvement comprising a shell disposed between the wall and the curved U-portions of the tubes of the matrix, means including a flexible seal between the wall and the shell for preventing flow of hot gases therebetween, and means including at least one brush seal between the shell and the curved U-portions of the tubes of the matrix for blocking passage therebetween of hot gases.

4,679,620

METHOD AND APPARATUS FOR CLEANING PLATE HEAT EXCHANGERS USED FOR RECOVERING HEAT FROM EXHAUST GASES

Klaus-Dieter Daun, Am Sounenhang 33, D 4300 Essen 17, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 834,882
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507203
Int. Cl.[4] F28G 9/00
U.S. Cl. 165—95 7 Claims



2. A device for cleaning plate heat exchangers of a type used for recovering heat from contaminated exhaust gases and comprising hollow heat exchanger plates arranged in spaced parallel relationship through which a heat exchange medium is

directed in an arrangement in which the exhaust gases are passed through the spaces between the plates, a plurality of through holes defined in each of said plates in aligned relationships, a soot blower mounting on said heat exchanger, a lance carried by said mounting and being rotatable and axially movable relative thereto in alignment with the holes of the plates, said lance being hollowed for carrying a cleaning medium having at least one radially discharging nozzle for discharging the cleaning fluid therefrom adjacent an end thereof, said lance being rotatable and axially movable for discharging the fluid over each of the plates.

4,679,621

SPIRAL HEAT EXCHANGER

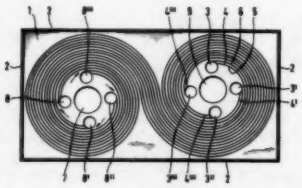
Jurgen Michele, Schortens, Fed. Rep. of Germany, assignor to Paul Grote, Friedrichsfehn, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,927

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505789

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—145 **3 Claims**



1. A recuperative spiral heat exchanger, comprising:

two interconected multi-channel spirals having opposed directions of spirals and composed of a multiplicity of spirally-extending, spaced-apart separating walls, each adjacent pair of which define a flow duct therebetween used in an alternate fashion for one of two oppositely flowing streams of medium, said two spirals together forming substantially S-shaped flow ducts lying substantially in the same plane,

a closed housing in which said two spirals are arranged, and

inflow and outflow openings for said flow ducts, said inflow openings being disposed in said housing approximately at the center of one of said spirals and said outflow openings being disposed in said housing approximately at the center of said other spiral.

4,679,622

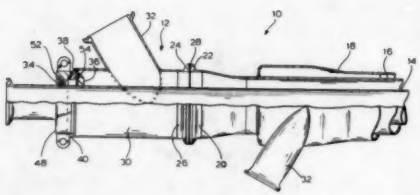
TAKE-APART FITTING FOR MULTI-TUBE HEAT EXCHANGER

Robert B. Cannon, Gulf Shores, Ala., assignor to Robert B. Cannon, Inc., Gulf Shores, Ala.

Filed Apr. 25, 1985, Ser. No. 727,294

Int. Cl.[4] F28D *7/10*

U.S. Cl. 165—154 **9 Claims**



1. A multi-tube heat exchanger comprising:

a first tube;

a second tube disposed about and concentric with said first tube;

an end of said second tube;

a fitting disposed about said first tube and coupled to said end of said second tube;

a cap ring disposed about and secured to the outer surface of said first tube;

an end cap secured to an end of said fitting, said end cap having a bore of sufficient diameter to receive said first tube extending therethrough;

clamp means for securing said end cap in position and to urge said end cap into sealing engagement with said cap ring, said end cap and said clamp means having mating surfaces machined to complementary, inverted, chamfered surfaces, whereby, as said clamp is tightened said surfaces are urged against each other;

said clamp means comprising a split champ, said first tube includes as clamp ring disposed about the outer surface thereof; and said clamp further includes a groove extending about the inner surface thereof for capturing said clamp ring.

4,679,623

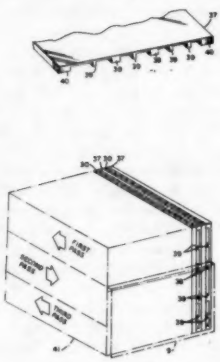
TRIPLE PASS CERAMIC CROSS-FLOW HEAT RECUPERATOR

Richard E. Landry, and Joel G. Reed, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 705,256, Feb. 25, 1985, abandoned, which is a division of Ser. No. 536,030, Sep. 26, 1983. This application Aug. 11, 1986, Ser. No. 895,531

Int. Cl.[4] F28F *3/00*

U.S. Cl. 165—166 **5 Claims**

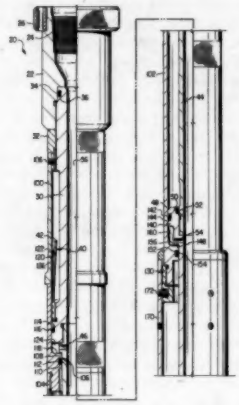


1. A heat recuperator comprising a cross flow ceramic core within a housing, the core comprising ribbed layers for the flow therethrough of combustion air to be heated, the core also comprising other ribbed layers for the flow therethrough of hot exhaust gas, the combustion air ribbed layers being stacked alternatively with the hot gas ribbed layers, the air flow through the combustion air ribbed layers being orthogonal to the gas flow through the hot gas ribbed layers, the air flow through the combustion air ribbed layers being triple pass, the passes being separated from each other by divider ribs, each pass having supporting ribs therein providing channels for the air flow, the construction of the divider ribs being such as to reduce the number of said supporting ribs required for support of all the layers in the core, the divider ribs being thicker than the ribs in the hot gas ribbed layers, the divider ribs being sealed to prevent air in one pass from leaking to an adjoining pass, and metal inserts in the housing that face with the divider ribs so as to cause the air flow to be triple pass.

4,679,624
HYDRAULIC SETTING TOOL

Monty E. Harris, Azle, and Richard A. Sukup, Burleson, both of Tex., assignors to The Western Company of North America, Fort Worth, Tex.

Filed Sep. 9, 1985, Ser. No. 774,023
Int. Cl.[4] E21B *23/04*
U.S. Cl. 166—120 **32 Claims**



1. An oil or gas well retainer setting and fluid pumping tool comprising:

means responsive to a first pressure to the interior bore of the tool for moving an actuation means into engagement with the retainer for setting said retainer;

means responsive to a second pressure in the bore of the tool for disengaging a plug means in the tool to open a passageway in said too to permit fluid flow through said tool, and

means within the tool for capturing said plug means in its disengaged position wherein said means for capturing said plug means comprises a fitting having a bore therein and expandable fingers receiving said disengageable plug means therein, said fingers serving to lock said plug means in said fitting when engaged therein.

4,679,625
OIL RECOVERY PROCESS USING A VISCOSITY ADJUSTED GELATION SYSTEM

David L. Gibbons, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Feb. 11, 1986, Ser. No. 828,464
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—270 **21 Claims**

1. A process for recovering oil from a subterranean oil-bearing formation penetrated by a wellbore and having a high permeability region bounded by at least one lower permeability region comprising the steps of:

preparing a crosslinkable polymer solution having a predetermined viscosity such that said solution is capable of penetrating said high permeability region at a predetermined rate to a predetermined depth;

providing a crosslinking agent in a solution capable of crosslinking said polymer, said crosslinking agent solution having a viscosity substantially less than said predetermined viscosity of said polymer solution;

adjusting the viscosity of said crosslinking agent solution by the addition of a viscosifying agent in an amount sufficient to raise the viscosity of said crosslinking agent solution substantially equal to that of said polymer solution such that said crosslinking agent solution is capable of penetrating said high permeability region at a rate and to a depth substantially equal to said predetermined rate and depth of said polymer solution and wherein said viscosifying agent is substantially unreactive with said crosslinking agent;

sequentially injecting a slug of said polymer solution and a slug of said crosslinking agent solution into said wellbore in fluid communication with said high permeability region;

displacing said sequentially injected slugs into said high permeability region such that said slugs penetrate said high permeability region at said predetermined rate;

substantially mixing said slugs at said predetermined depth in said high permeability region;

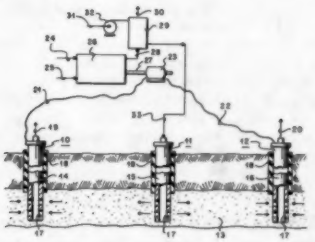
crosslinking said polymer with said crosslinking agents to form a crosslinked polymer gel which substantially reduces the permeability of said high permeability region; and

recovering oil from said formation.

4,679,626
ENERGY EFFICIENT PROCESS FOR VISCOUS OIL RECOVERY

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 560,696, Dec. 12, 1983, abandoned. This application Mar. 11, 1986, Ser. No. 839,459
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—248 **3 Claims**



1. A method of producing viscous hydrocarbons from a subterranean formation in which plural spaced apart wellbores have been drilled, said method comprising:

providing means for burning a combustible material to generate hot gases and for using said hot gases to continuously generate electrical power and to continuously heat a well injection liquid, said means including first and second heat exchangers each having means providing separate flow paths for combustion air, working gas and injection liquid, a gas compressor and a gas expander operably connected for operation with a working gas, said gas expander being drivingly connected to generator means and responsive to working gas being expanded through said gas expander for generating said electrical power;

providing electrode means in at least two of said wellbores;

simultaneously generating electrical power and heating said injection liquid by passing combustion air, working gas and injection liquid through said first heat exchanger to heat said combustion air and said injection liquid, burning said combustible material with said combustion air, passing said injection liquid, working gas and heated flue gas produced from said burning through said second heat exchanger to heat said working gas and said injection liquid;

using said electrical power to cause electrical current to pass between said electrode means in a manner such that said viscous hydrocarbons are heated; and

simultaneously, while heating said viscous hydrocarbons with said current, injecting heated injection liquid into said formation through one of said wellbores to cause said

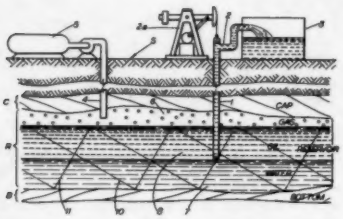
viscous hydrocarbons to flow through said formation to one of said at least two wellbores.

4,679,627

METHOD OF OIL RECOVERY

William M. Harrison, 6666 Chimney Rock, #14, Houston, Tex. 77081

Continuation-in-part of Ser. No. 764,718, Aug. 12, 1985, Pat. No. 4,648,449. This application Dec. 26, 1985, Ser. No. 813,472
Int. Cl.[4] E21B *43/25*
U.S. Cl. 166—249 19 Claims



1. A method of recovering petroleum from an underground reservoir comprising the steps of:

(a) injecting into said reservoir a substantially water insoluble gas to form a gas cap forcing oil and water toward the bottom of said reservoir;

(b) generating one or more pressure waves and directing said pressure waves into said reservoir to release petroleum fluids retained by said reservoir; and

(c) producing said petroleum fluids through a well communicating with said reservoir;

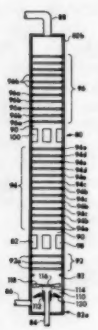
said method being further characterized by performing additional fluid injection steps during step (a).

4,679,628

DILUTION APPARATUS AND METHOD

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 470,258, Feb. 28, 1983, abandoned, Division of Ser. No. 279,027, Jun. 30, 1981, Pat. No. 4,402,916. This application Nov. 13, 1985, Ser. No. 797,609
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—252 8 Claims



1. In a process for the secondary and tertiary recovery of oil from an oil-bearing subterranean formation having at least one input well and at least one output well which process includes the preparation of an aqueous solution of a polymer consisting essentially of a partially hydrolyzed polyacrylamide capable of meeting the performance demands of an oil-bearing subterranean formation into which the polymer solution is introduced, the step of diluting the aqueous polymer solution having a polymer concentration such that the solution has a gel-like consistency to provide an aqueous polymer solution having a polymer concentration such that the solution has a substantially non-gel-like consistency while at the same time minimizing polymer degradation as the aqueous polymer solution is undergoing a physical change from a gel-like consistency to a substantially non-gel-like consistency thereby enabling the partially hydrolyzed polyacrylamide to retain its capability for meeting the performance demands of an oil-bearing formation into which an aqueous solution containing said polymer is introduced, said dilution being carried out by continuously dispersing an aqueous solution of said polymer of known concentration having a gel-like consistency into a chamber, having an inlet and an outlet, by passing the polymer solution through distributor means at the inlet of the chamber to increase the surface area of the gel-like polymer solution; continuously introducing into the chamber an aqueous diluent for said aqueous polymer solution in an amount such that the concentration of the aqueous polymer solution in the chamber will be altered to a preselected lower concentration, said aqueous diluent being of a character such that it will be absorbed by the gel-like polymer solution; continuously and successively moving the aqueous polymer solution and said diluent through a series of flow control and polymer solution dispersing stations positioned in said chamber in spaced relation to one another between the inlet and the outlet of the chamber, each of the flow control stations comprising static mixers positioned between at least two of said polymer solution dispersing stations for regulating the flow pattern of the polymer solution as it passes from one dispersing station to the next and to impart uniformity to the flow of the aqueous polymer solution, each of the polymer solution dispersing stations comprising screens, the perforations of which act to disperse and progressively increase the surface area of said polymer solution whereby greater amounts of the aqueous diluent will be absorbed by said polymer as it passes through each of said dispersing stations until the aqueous polymer solution has a substantially non-gel-like consistency and said preselected lower concentration is attained when the polymer solution reaches the outlet of the chamber; discharging the diluted aqueous polymer solution from the outlet of the chamber at said preselected lower concentration; and further diluting said discharged solution with an aqueous diluent to a preselected still lower concentration of said polymer prior to injection into an input well of an oil-bearing subterranean formation.

4,679,629

METHOD FOR MODIFYING INJECTIVITY PROFILE WITH BALL SEALERS AND CHEMICAL BLOCKING AGENTS

Milton K. Abdo, Dallas, and Alfred R. Jennings, Jr., Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,271
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—281 11 Claims

1. A method for selectively closing off zones in a hydrocarbonaceous fluid producing formation or reservoir which contains at least one zone of greater permeability and at least one zone of lesser permeability which method is effective in producing increased amounts of hydrocarbonaceous fluids and where said zones are in fluid communication with at least one injection well and at least one production well comprising:

(a) determining the permeability profile of said formation or reservoir and ascertaining the existence of at least one zone of greater permeability and at least one zone of lesser permeability;

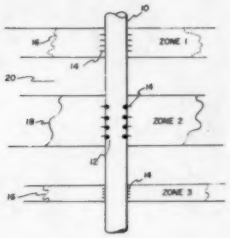
(b) introducing into the wellbore having perforations therein fluidly connected to said zones, an injection fluid with ball sealers therein which are sufficient to seal off said zone of greaer permeability when seated in said perforations;

(c) injecting a temporary blocking agent into said zone of

lesser permeability which agent is sufficient to close pores in said zone of lesser permeability;

(d) removing said sealers from said zone of greater permeability;

(e) injecting a permanent blocking agent into said zone of greater permeability after removal of said ball sealers;



(f) causing a reaction to take place in said zone of lesser permeability which reaction is sufficient to remove said temporary blocking agent; and

(g) injecting a fluid sufficient to remove hydrocarbonaceous fluids from said zone of lesser permeability via said production well.

4,679,630

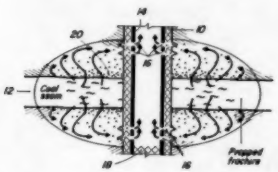
METHOD OF COMPLETING PRODUCTION WELLS FOR THE RECOVERY OF GAS FROM COAL SEAMS

Richard E. Wyman, Calgary, Canada, assignor to Canadian Hunter Exploration Ltd., Calgary, Canada

Filed Dec. 23, 1985, Ser. No. 812,639

Int. Cl.[4] E21B *43/26*

U.S. Cl. 166—305.1 **4 Claims**



1. A method of completing production wells for the recovery of gas from a coal seam and having a casing cemented in the well, comprising the steps of:

(a) providing perforations in the casing opposite earth formations located above and/or below the coal seam; and

(b) hydraulically fracturing the coal seam through the perforations in the casing, said fracturing of the coal seam propagating initially through the earth formations located above and/or below the coal seam and providing a filter for the coal fines to prevent their migration toward said perforations and plugging or impairment of the perforations during withdrawal of gas from the coal seam through the perforations.

4,679,631

COMPOSITION AND METHOD OF STIMULATING SUBTERRANEAN FORMATIONS

Walter R. Dill; Michael L. Walker, and William G. F. Ford, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 3, 1986, Ser. No. 882,127

Int. Cl.[4] E21B *43/26, 43/27*

U.S. Cl. 166—307 **20 Claims**

1. A method of treating a subterranean formation containing iron comprising contacting a subterranean formation with an aqueous fluid containing a compound consisting essentially of at least one member selected from the group consisting of dihydroxymaleic acid, salts of dihydroxymaleic acid, gluconodeltalactone present in an amount sufficient to substantially prevent the precipitation of ferric iron in said aqueous fluid during said contacting with said subterranean formation.

4,679,632

REMOTELY CONTROLLED RISER CONNECTION

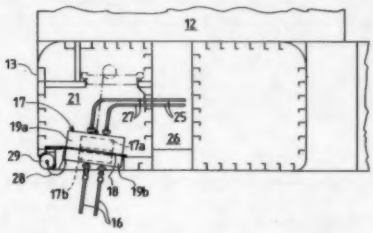
Lars Bengtsson, Torslanda, and Johan Sjölander, Gothenburg, both of Sweden, assignors to Gotaverken Arendal AB, Sweden

Filed Apr. 22, 1986, Ser. No. 854,539

Claims priority, application Sweden, May 15, 1985, 8502419

Int. Cl.[4] E21B *43/01*

U.S. Cl. 166—345 **4 Claims**



1. A vessel for processing crude oil and/or gas and including a watertight compartment adjacent to its bottom plating, said compartment communicating by way of at least one product transfer pipe with a processing plant or with storage means within the vessel and connectable to at least one riser conduit extending from a well at the sea floor, a recessed sealing collar within said bottom plating,

a two part connection piece having a first part connected to said product transfer pipe and a second part connected to said riser conduit,

means for watertightly mounting said first part in said collar, and

remotely releasable means for holding said second part to said first part.

4,679,633

METHOD FOR DEPTH ADJUSTMENT OF A TILLING MACHINE

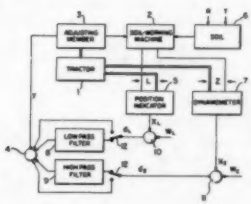
Wolfgang Kauss, Lohr-Wombach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,010

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337317

Int. Cl.[4] A01B *63/112, 79/00*

U.S. Cl. 172—1 **14 Claims**



1. A method for adjusting the working depth of a soil-tilling

machine that is carried by a tractor, the position of the soil-tilling machine being adjusted in relation to the tractor, said method comprising

extracting by a first control loop a high frequency component of a traction signal equal to, at the least, a predetermined cut-off frequency, said traction signal representing the traction as produced on the soil-tilling machine in the soil,

extracting by a second control loop a low frequency component of a position signal equal to, at the most, said predetermined cut-off frequency, said position signal representing the position of the soil-tilling machine in relation to the tractor,

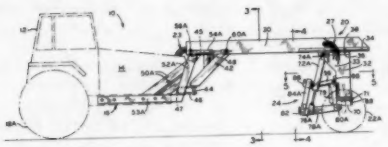
mixing said extracted components only of said traction and position signals to generate an adjusting signal for controlling the elevation of the soil-tilling machine with respect to the tractor by keeping said first control loop and said second control loop separate so that the elevation adjustments caused by said traction signal and said position signal, respectively, are mutually independent.

4,679,634

APPARATUS FOR EXTENDING THE FRAME OF A TRACTOR

Gerald L. Bulmahn, Rural Rte. 8, P.O. Box 173, Decatur, Ind. 46733

Filed Feb. 11, 1986, Ser. No. 828,287
Int. Cl.[4] A01B *59/044, 63/104*
U.S. Cl. 172—250 **12 Claims**



1. An apparatus for extending the frame of an agricultural tractor adapted for pulling farm implements for adapting said tractor to ridge or no till farming, said tractor including a set of rear wheels, a frame, a set of front wheels, and an engine mounted between said front and rear wheels, the apparatus comprising:

a longitudinal extension frame;

extension frame attaching means connected to said extension frame for attaching said extension frame to said tractor frame along with removal of said tractor front wheels;

pivoting means secured to said extension frame to enable pivoting of at least a portion of said extension frame relative to said tractor frame about a substantially vertical axis;

front wheel attaching means connected to said extension frame for attaching at least two front wheels to said extension frame;

a hydraulically operated steering apparatus operably secured to said front wheels and to said extension frame pivoting means;

hydraulic fluid hose extension means for connecting the tractor hydraulic steering control means to said hydraulic steering apparatus; and

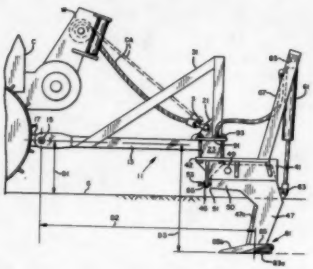
a three point hitch connected to said extension frame for attaching an agricultural implement to said extension frame at a position intermediate said front wheel attaching means and said extension frame attaching means.

4,679,635

SELF-TRIPPING RIPPERS

Eddie L. Fields, 26979 Dawson Rd., Monroe, Oreg. 97456

Filed Oct. 28, 1985, Ser. No. 790,665
Int. Cl.[4] A01B *13/08;* **E02F** *5/32*
U.S. Cl. 172—260.5 **2 Claims**



1. Apparatus comprising a crawler tractor equipped at its rear with a winch operated cable,

said crawler tractor having a rearwardly extending drawbar,

a ground ripping attachment comprising a main frame having a forward portion pivotally connected to said drawbar for pivotal movement about a horizontal axis,

said attachment having ground engaging ripping means disposed rearwardly of said axis,

cable attaching means on said main frame spaced rearwardly of said axis to facilitate connection of said cable and elevation of said attachment where said ripping means is clear of the ground to provide for travel of the tractor from one place to the other,

said cable when unwound sufficiently completely releasing said attachment to facilitate unrestrained contact of said ripping means with the ground,

and means independent of said cable and said tractor for varying the depth at which said ripping means rips the ground,

wherein the horizontal spacing of said ripping means rearwardly of said axis is a multiple of the vertical distance from said tractor drawbar from the ground surface,

and wherein the vertical spacing of the bottom portions of said rippng means from a horizontal plane containing said axis, in the ripping position of said ground ripping means, is substantially greater than said vertical distance, but substantially less than said horizontal spacing,

said ripping means comprising a series of laterally related ground ripping members, each being pivotally mounted on the main frame for pivotal movement about a horizontal axis upwardly and rearwardly from a down operative position for automatic tripping upon engagement with an immovable object,

accumulator means for releasably biasing said ground ripping members to remain in their operative positions,

the sole ripping means for said attachment comprising a flyte on the lower end of each ground ripping member,

each said flyte having a central portion having a relatively flat bottom surface and an inclined upper surface,

each said flyte having a pair of wing portions flanking the central portion and having upper faces inclined forwardly and downwardly to define front edges which in plan angle rearwardly,

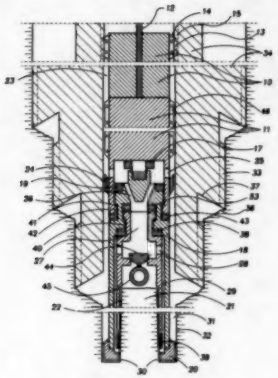
said flytes together with the above recited spatial relationship enabling said ground ripping means to seek its own depth of penetration in the soil while being freely released from said cable.

4,679,636

METHOD AND APPARATUS FOR CORING ROCK

James L. Ruhle, 2535 E. Balfour Ave., Fullerton, Calif. 92634

Filed Oct. 16, 1986, Ser. No. 919,650
Int. Cl.[4] E21B *10/02, 25/04*
U.S. Cl. 175—58 **4 Claims**



1. The invention of a wire-line conveyed assembly of downhole reversible electrically-driven high-speed thin-kerf coresampling apparatus comprising:

a suitable wire-line conveyance system with connecting means suitable for the support and conveyance of said coresampling assembly through suitable cylindrical conduit to and from the bottom of a hole excavated in rock, and with electrical-connecting means suitable for the transmission of electric power to said core-sampling assembly,

a suitable weighted unit, or sinker bar, through which passes said suitable wire-line conveyance system, and to which is rigidly affixed a plurality of guide fins arranged in a longitudinal manner on the exterior surface of said suitable weighted unit, or sinker bar,

a suitable reversible direct-current electric motor rigidly affixed to the bottom of said suitable weighted unit, or sinker bar, to which is rigidly affixed a plurality of centralizing heat-sink fins, arranged in a longitudinal manner on the exterior surface of said suitable direct-current electric motor, with suitable electrical-connecting means between said suitable wire-line conveyance system and said suitable direct-current electric motor, and with a motor-case extension and a suitable splined rotational output shaft extending downward from the bottom of said suitable direct-current electric motor, said suitable splined rotational output shaft enveloped at the bottom of said suitable direct-current electric motor by suitable pressure-actuated sealing means so as to exclude outside fluid entry into said suitable direct-current electric motor,

a suitable pressure-actuated annular cup seal enveloping said motor-case extension with its sealing lip facing up, and a plurality of side ports through said motorcase extension, said side ports situated above said suitable up-facing pressure-actuated annular cup seal, and a circumferential inward-facing shoulder rigidly affixed to the bottom of said motor-case extension, below which is situated a suitable bearing support, or circumferential thrust bearing,

a suitable rotating outer cylindrical core barrel with suitable splined connecting means to said suitable splined rotational output shaft, containing a circumferential out-facing shoulder around its topmost perimeter, above which is situated suitable pressure-actuated sealing means, said suitable rotating outer cylindrical core barrel also containing a plurality of inclined fluid passageways at its top, below which is situated, at the lowermost extremity of said suitable cylindrical core barrel, a suitable core bit containing suitable water courses,

a suitable nonrotating inner cylindrical core barrel containing at its topmost extremity suitable pressure-actuated sealing means, below which is situated a central and axial fluid passageway, said suitable nonrotating inner cylindrical core barrel also containing near its top a circumferential out-facing shoulder upon which is situated a suitable swivel bearing, and below which is situated a plurality of side ports and a suitable oneway check valve that allows fluid passage in an upward direction only, whereas near the lower extremity of said suitable nonrotating inner cylindrical core barrel is situated circumferentially near its bottom interior a suitable core-restraining device, or core catcher,

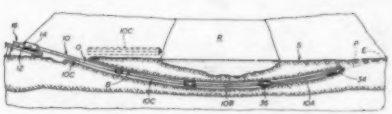
a suitable hole-enlarging means, or hole opener, operating in either the linear-motion or rotational excavation mode, with said suitable hole enlarging means, or hole opener, containing a central and axial bore of sufficient diameter to allow the passage of said reversible electrically-driven core-sampling assembly, with said central and axial bore containing in its wall a plurality of longitudinally-arranged guide slots.

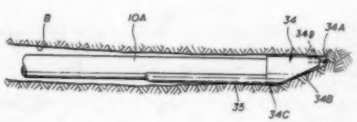
4,679,637

APPARATUS AND METHOD FOR FORMING AN ENLARGED UNDERGROUND ARCUATE BORE AND INSTALLING A CONDUIT THEREIN

Martin D. Cherrington, and William D. Cherrington, both of Cherrington Corp., 7398 San Joaquin, Sacramento, Calif. 95820

Continuation-in-part of Ser. No. 733,723, May 14, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,344
Int. Cl.[4] E21B *7/04, 7/08*
U.S. Cl. 175—61 **50 Claims**





1. A method for drilling an arcuate underground pilot bore hole along a predetermined arcuate path in one direction of travel between two surface locations, and then enlarging the pilot bore hole in an opposite direction of travel between the surface locations to receive a production conduit therein, the bore hole being drilled by a drill pipe string of connected pipe sections including a leading drill pipe section of a smaller diameter than the diameter of at least the majority of the remaining pipe sections, said method comprising the steps of:

advancing the small diameter leading drill pipe section with a drill bit thereon in one direction of travel along the arcuate path from a surface entry location to a surface exit location;

removing the small diameter leading drill pipe section from the drill pipe string after exit from the exit location;

attaching a reamer and production conduit connected thereto to the drill string at the exit location after the small diameter leading pipe section has been removed;

pulling the drill string, reamer, and production conduit along the pilot bore hole from the exit location to the earth

entry location in an opposite direction of travel with the reamer forming an enlarged opening to receive the production conduit;

rotating said drill string and reamer during pulling thereof; and

circulating drilling fluid through said drill string during the drilling and reaming operations.

11. Apparatus for drilling an arcuate underground pilot bore hole along a predetermined inverted arcuate path between two spaced earth surface locations; said apparatus comprising:

a drill pipe string including a plurality of connected pipe sections extending from one surface location into a bore entrance opening of the pilot bore hole;

means at said one surface location to apply a thrust on said pipe string;

said drill pipe string having a leading pipe section with a drill bit thereon and being of a flexibility greater than the other pipe sections; and,

means to circulate drilling fluid during the drilling operation.

4,679,638

DOWNHOLE PROGRESSIVE CAVITY TYPE DRILLING MOTOR WITH FLEXIBLE CONNECTING ROD

Jay M. Eppink, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 711,322, Mar. 13, 1985, Pat. No. 4,636,151. This application Dec. 27, 1985, Ser. No. 814,335

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.[4] **E21B** *4/02;* **F03C** *2/00;* **F16D** *3/04*

U.S. Cl. 175—107 **10 Claims**

1. A downhole drilling motor, comprising:

a stator of the progressive cavity type;

a rotor, within the stator, wherein the rotor rotates and gyrates in response to fluid flow through the stator;

a housing, connected to the stator;

a bearing shaft, concentrically located within the housing, and rotatable about the longitudinal axis of the bearing shaft and the housing;

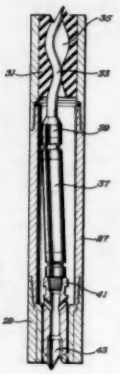
a bearing between the housing and the bearing shaft;

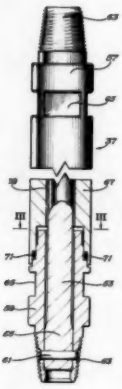
a flexible rod, extending between the rotor and the bearing shaft, for translating the rotation and gyration of the rotor to the true rotation of the bearing shaft;

an upper threaded connection, nonintegral to, but connected to one end of the rod, for connecting the rod to the rotor;

a lower threaded connection, nonintegral to, but connected to the other end of the rod, for connecting the rod to the bearing shaft;

a cylindrical overload sub, located concentrically around the rod; and





means for engaging the sub and the selected connection in a manner so as to allow the connections to rotate axially a limited amount in relation to one another.

4,679,639

ROTARY DRILL BITS AND CUTTING ELEMENTS FOR SUCH BITS

John D. Barr, Cheltenham, and Michael T. Wardley, Hardwicke, both of England, assignors to NL Petroleum Products Limited, Cheltenham, England

Filed Nov. 30, 1984, Ser. No. 676,696

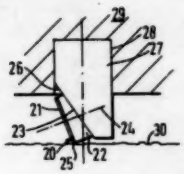
Claims priority, application United Kingdom, Dec. 3, 1983, 8332343; Feb. 28, 1984, 8405181

Int. Cl.[4] **E21B** *10/46*

U.S. Cl. 175—329 **26 Claims**

1. A cutting element for a rotary drill bit comprising a thin hard facing layer, defining a front cutting face, bonded to a less hard backing layer, defining a rear face and lateral surfaces, the backing layer being fabricated of non-uniform thickness, thicker adjacent the cutting edge of the facing layer than it is over the rest of the area of the facing layer, wherein the general plane of the facing layer is disposed generally at right

angles to the central axis of the cutting element, and the general plane of the rear surface of the backing layer is inclined at



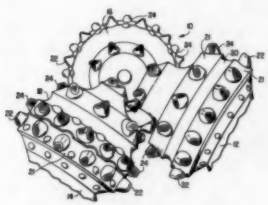
an angle of less than 90° to the central axis so as to provide the required variation in thickness.

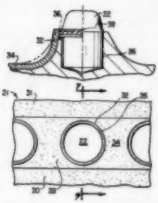
4,679,640

METHOD FOR CASE HARDENING ROCK BITS AND ROCK BITS FORMED THEREBY

Micheal B. Crawford, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 21, 1986, Ser. No. 832,490
Int. Cl.[4] E21B *10/52*
U.S. Cl. 175—374 **15 Claims**





1. In the method of manufacturing rock bits for earth boring, the steps comprising:

(a) profiling a cutter blank to define at least one circumferential row on which cutter inserts are to be supported in an interference fit in cavities formed in said circumferential row;

(b) carburizing the cutter blank;

(c) machining a plurality of preselected surface areas of said circumferential row at the locations at which said cavities are to be formed while substantially retaining the carburizing in the remaining areas of said circumferential row, said machining exposing an uncarburized area of said blank slightly greater than the inserts when supported in their respective cavities;

(d) metallurgically hardening the carburized areas of said blank;

(e) forming insert cavities in said circumferential row at locations within said preselected surface areas of transverse dimension less than the corresponding dimension of said inserts; and

(f) pressing cutter inserts into said cavities to effect an interference fit spaced from said hardened surface to maintain the surface of said circumferential row substantially free of stress cracking in the areas surrounding said inserts.

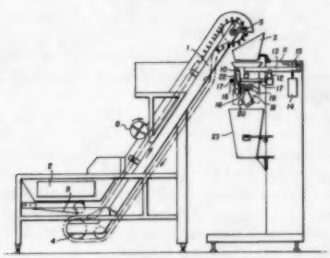
7. In a rotary rock bit having at least one rolling cutter member for forming a borehole in the earth, said rolling cutter member having at least one annular surface containing an annular row of cutter inserts mounted in an interference fit in socket cavities in said annular surface for cutting the inner portions of a borehole, the improvement comprising said annular surface being case hardened to include the land area substantially between adjacent cutter inserts thereon and a narrow substantially concentric band of land area contiguously surrounding each of said insert cavities, said band area being larger than the corresponding dimension of the insert thereat and substantially devoid of case hardening whereby the surface areas of said annular surface surrounding said inserts are substantially free of stress cracking induced by said interference fit.

4,679,641

APPARATUS FOR FEEDING SPROUTING BEANS OR THE LIKE IN FIXED QUANTITIES

Sanji Kawakami, Kodaira, Japan, assignor to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,700
Claims priority, application Japan, Aug. 16, 1984, 59-170930
Int. Cl.[4] G01G *13/24, 13/04*
U.S. Cl. 177—114 **4 Claims**



1. An apparatus for feeding sprouting beans or the like in fixed quantities, which comprises:

a framework having a first arm extending therefrom and a second arm extending therefrom and having a plurality of rollers mounted thereon;

a weighing bucket having a discharging mechanism at the bottom, said weighing bucket being received by said rollers of said second arm so as not to be pivoted from side to side;

a load cell connected to said first arm for detecting the weight of said weighing bucket;

a raking-up conveyor comprising a conveying belt arranged standingly slantwise from a lower sprouting beans reservoir to said weighing bucket, with a plurality of needlelike projections extending therefrom, which conveys continuously the sprouting beans from said reservoir to said weighing bucket while holding the sprouting beans by means of said needlelike projections;

conveyor control means for decreasing the conveying speed of said raking-up conveyor when said load cell detects a predetermined primary weight of the weighing bucket; and

means for intermittently actuating the discharging mechanism of said weighing bucket to discharge the sprouting beans in its interior when said load cell detects a predetermined secondary weight of the weighing bucket.

4,679,642

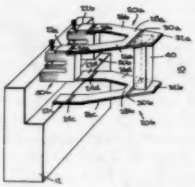
SPRING-TYPE ADJUSTABLE MOUNTING FOR WEIGHING SCALE FLEXURES

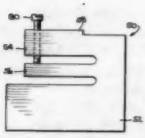
Marilyn A. Brock, Morris Plains, and Daniel G. Scheffer, Rockaway Township, Morris County, both of N.J., assignors to Ohaus Scale Corporation, Florham Park, N.J.

Filed Aug. 4, 1986, Ser. No. 892,326

Int. Cl.[4] G01G *23/14, 3/08*

U.S. Cl. 177—164 **7 Claims**





1. Apparatus for adjusting the position of a flexure mounting in a weighing scale having a base and at least one flexure mounting comprising:

first spring means for resiliently connnecting the flexure mounting to the base, said first spring means having a relatively high spring constant;

second spring means having a relatively low spring constant; and

control means movable relative to said base and operatively connected to said first and second spring means so that most of the motion of said control means results in deflection of the second spring means and only a minor portion of said motion results in deflection of the first spring means and the flexure mounting.

4,679,643

CAPACITIVE WEIGHING DEVICE

Bertrand Bové, Wichelen, Belgium, assignor to Advanced Micro Electronic Components and Systems, Belgium

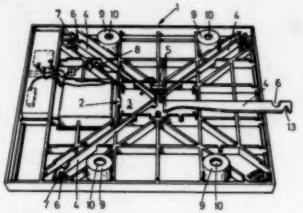
Filed Jan. 17, 1986, Ser. No. 820,548

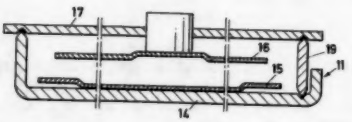
Claims priority, application Netherlands, Jan. 21, 1985, 8500139

Int. Cl.[4] G01G *3/14;* **H01G** *7/00, 5/01*

U.S. Cl. 177—210 C **7 Claims**

1. Capacitive weighing device, comprised of a frame or substructure, four arms arranged in cross shape or substantially in cross shape and hingedly supported on knife-edges in said frame, a weighing plate vertically movable relative to said frame, bearing through knife-edges on said arms, in notches provided therefor in the arms, in which said arms bear with the mutually-facing ends thereof on a spring plate, wherewith an armature or upmost capacitive plate is insulatedly connected, said spring plate bearing with the one end thereof on one upstanding side from a box-like holder with a bottom whereon a metal film which acts as a lowermost capacitive plate is insulatedly fixed, and bearing with the opposite end thereof on an upstanding knife-edge, said knife-edge being supported in two slots provided in the bottom, in such a way that during a weighing operation, said knife-edge may slightly swing and





always form substantially the same angle with the spring plate bearing on said knife-edge.

4,679,644

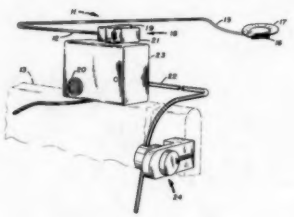
CHIN ACTUATED CONTROLLER SYSTEM FOR CONTROLLING POWERED APPARATUS

John H. Loveless, Westminster, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 19, 1985, Ser. No. 799,712

Int. Cl.[4] B62D *11/04*

U.S. Cl. 180—6.5 **47 Claims**



1. A chin acutated controller system for enabling a person to control, by chin movements, the operation of a powered apparatus responsive to proportional control signals, said chin actuated controller system comprising, in combination:

a control arm having a first end mounted for pivotal movement in a horizontal plane about a vertical axis in proportion to sideways movements of the chin of the person and in a vertical plane about a horizontal axis in proportion to vertical movements of the chin of the person and a distal end extending to a location adjacent the chin of the person controlling the powered apparatus;

a chin pad supported at the distal end of said control arm engageable by the person's chin, enabling the person to depress said control arm vertically and simultaneously swing said control arm horizontally by turning the person's head;

controller electrical circuit means including first and second power control means for controlling the supply of power from a power source to said powered apparatus, said first and second power control means each having an operating member movable to adjust the power supplied to the powered apparatus; and

cam mechanism means operatively connecting said control arm to each operating member of said first and second power control means for transmitting movement thereto in response to the chin activated pivotal movements of said control arm, thereby producing proportional control signals to said powered apparatus in proportion to the vertical depression of said control arm about said horizontal axis and sideways left or right movement of said control arm about said vertical axis.

4,679,645

MECHANICAL DEVICE FOR TRANSMITTING SIGNALS THROUGH A SWIVEL CONNECTION

James J. Galloway, 2309 Via Anacapa, Palos Verdes Estates, Calif. 90274, and Anthony Madrigal, 655 N. Acacia, Reedley, Calif. 93654

Filed Feb. 27, 1985, Ser. No. 706,146

Int. Cl.[4] B60K *1/00*

U.S. Cl. 180—65.8 **8 Claims**

1. In a rotatable mechanical coupling including a hollow shaft having an axis of rotation and extending along the axis of rotation through a barrier and mounting lockable rotatable mechanical apparatus for rotation with respect to said barrier on one side thereof about said axis of rotation of said hollow shaft, the improvement comprising:

transducer means positioned on the opposite side of said barrier from said mechanical apparatus for indicating the locked or unlocked condition of the mechanical apparatus to be actuated via said hollow shaft;

a plurality of displaceable members within said hollow shaft;

means confining said plurality of displaceable members within said hollow shaft whereby said displaceable members are displaceable to actuate said transducer means;

flexible means having one end portion coupled to the mechanical apparatus mounted for rotation therewith and movable to the different positions dependent upon two different conditions of said mechanical apparatus, namely locked and unlocked positions;

said confining means including an opening therein positioned to allow a second end of said flexible means to enter said hollow shaft and displace said displaceable means dependent upon the position of said flexible means to cause actuation of said transducer at one of said conditions.

4,679,646

DRIVELINE FOR REGENERATIVE BRAKING

Christopher J. Greenwood, Leyland, United Kingdom, assignor to Leyland Vehicles Limited, Leyland, United Kingdom

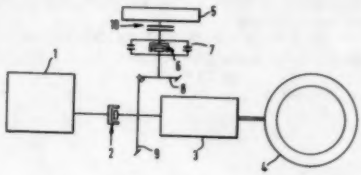
Filed Mar. 12, 1984, Ser. No. 588,656

Claims priority, application United Kingdom, Mar. 15, 1983, 8307059

Int. Cl.[4] B60K *9/00*

U.S. Cl. 180—165 **3 Claims**

3. A driveline for a vehicle, comprising a continuously-variable-ratio transmission, an engine for driving the transmission, a flywheel system for the regenerative braking of the vehicle, an engine clutch for coupling the engine to an input of the transmission only when its speed on the engine side would exceed that on the transmission side, a first flywheel clutch coupling the flywheel system to the transmission input only when its speed on the flywheel side would exceed that on the transmission side, and a second flywheel clutch parallel to the first, and operable to couple the flywheel to the transmission



input for regenerative braking; wherein control means responds to the speeds on the flywheel side and on the transmission side to engage a multiplate clutch only when those speeds are equal and to disengage the clutch when the flywheel is to be disengaged.

4,679,647

REAR SEAT COVER FOR VEHICLES HAVING A SADDLE-SHAPED SEAT

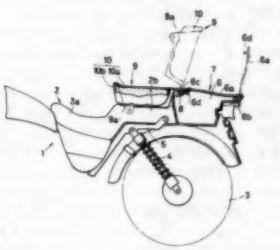
Katsusuke Komuro, Chofu, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,838

Claims priority, application Japan, May 29, 1985, 60-80712[U]

Int. Cl.[4] B62J *1/08*

U.S. Cl. 180—219 **3 Claims**



1. A seat assembly for a motorcycle comprising:

a tandem seat having a front and rear seat and positioned upon a frame between a front and rear wheel;

an accommodating box positioned at the rear end of said tandem seat and having a height taller than said tandem seat; and

a rear seat cover positioned between said tandem seat and accommodating box and being swingable between an upright and level position, wherein when said rear seat cover takes said level position, said rear seat cover substantially covers the whole surface of said rear seat and a top surface of said rear seat cover and said accommodating box form a substantially continuous even plane.

4,679,648

ALARM DEVICE FOR AUTOMOBILES AND SIMILAR VEHICLES

Kim L. Johansen, No. 12 Oldenvej, DK-3490 Kvistgaard, Denmark

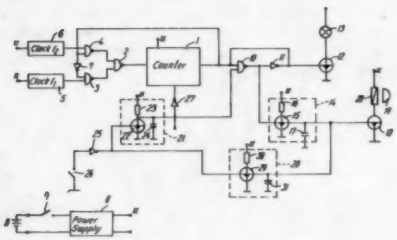
PCT No. PCT/DK85/00084, § 371 Date Apr. 21, 1986, § 102(e) Date Apr. 21, 1986, PCT Pub. No. WO86/01468, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 23, 1985, Ser. No. 857,759

Claims priority, application Denmark, Aug. 23, 1984, 4036/84

Int. Cl.[4] G08B *21/00*

U.S. Cl. 180—272 4 Claims



1. An alarm device for automobiles and similar vehicles, comprising a pulse timer (1) connected to the battery (B) of the vehicle through a contact (9) activated upon forward driving in a high gear, said pulse timer being further connected to a warning lamp (13) and through a first timing circuit (14) to an acoustic alarm generator (19) for operation of the latter after a first predetermined time interval following activation of the warning lamp (13), a switch (10) being connected between the pulse timer (1) on one hand and the warning lamp (13) and said timing circuit (14), respectively, on the other hand, and being controlled by a contact (26) selectively operable by the driver to interrupt the signal connection between the pulse timer (1) and the warning lamp (13) and the first timing circuit (14), respectively, characterized in that the pulse timer is a counter (1) which in a closed condition of said switch (10) supplies its activation signal in a predetermined final counting position, that said counter (1) from a first clock generator (5) or from a second clock generator (6), respectively, which are connected to the counter (1) over a logic switching circuit (2 to 4) either with a first counting pulse sequence in a first counting condition lasting until occupying said final counting condition or with a second counting pulse sequence in a second counting condition initiated by activation of the logic switching circuit in response to the counter (1) generating said activation signal, said second counting pulse sequence having substantially higher frequency (f_2) than said first sequence (f_1), a second timing circuit (21) being connected to said selectively operable contact (26) for supplying a stop signal to the counter (1) during a predetermined second time interval following the driver's activation of said contact (26) and supplying at the expiry of said second time interval a control signal to said switch (10) for re-establishing the signal connection between the counter (1) and the warning lamp (13) and the first timing circuit (14), respectively.

4,679,649

MOTOR VEHICLE ENGINE MOUNTING ARRANGEMENT

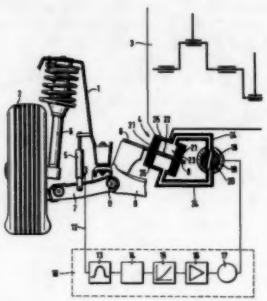
Klaus Hoerig, Gross-Gerau, and Hans-Joachim Gora, Bischofsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1985, Ser. No. 791,754

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444297

Int. Cl.[4] B60K *5/00*

U.S. Cl. 180—291 3 Claims



1. Mounting of an engine with at least one hydraulically damped spring element on a body of a motor vehicle having a wheel which is spring mounted with respect to the body characterized by a displacement transducer between the body and the wheel, and the hydraulically damped spring element including two chambers in fluid connection through a throttle valve operatively connected to the displacement transducer so that as the signal from the displacement transducer increases as a result of a variation in distance between the body and the wheel hydraulic damping of the spring element increases.

4,679,650

HEARING AID EAR MOLD END PIECE FOR THE AUDITORY CANAL AND HEARING AID EAR MOLD

Ludwig M. Moser, Estenfeld, and Anton Kammermeier, Welden, both of Fed. Rep. of Germany, assignors to Westra Electronic GmbH, Fed. Rep. of Germany

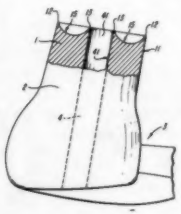
PCT No. PCT/EP85/00132, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985, PCT Pub. No. WO85/04779, PCT Pub. Date Oct. 24, 1985

PCT Filed Mar. 28, 1985, Ser. No. 809,885

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413067

Int. Cl.[4] A61B *7/02*

U.S. Cl. 181—130 15 Claims



1. An end piece for use with a hearing aid mold for an auditory canal, the end piece comprising:

a body having an end face and an outer circumference which substantially matches the contours of the auditory canal;

a sound discharge opening passing through said body;

said end face forming a concave annular channel extending at least partially around said sound discharge opening such that a first edge is defined which lies adjacent said outer circumference and a second edge is defined which lies adjacent said sound discharge opening; and

said first and second edges being relatively sharp edges.

4,679,651

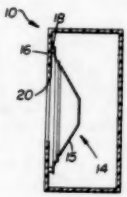
LOUDSPEAKER ENCLOSURE

Robert D. Peeters, 712 McDuff Ave., Fremont, Calif. 94538

Filed Dec. 2, 1982, Ser. No. 446,425

Int. Cl.[4] G05K *5/00*

U.S. Cl. 181—155 **16 Claims**



1. A loudspeaker and enclosure comprising: a housing having an opening therein, said opening defined by an aperture in a front wall of said housing;

a loudspeaker with a diaphragm, said diaphragm including a peripheral mounting portion at the mouth thereof;

means attached to said front wall and said peripheral mounting portion of said diaphragm, said means mounting said loudspeaker inside said housing with the mouth of said diaphragm facing said front wall, and said means spacing the peripheral mounting portion of said diaphragm from said front wall in the range of one-sixteenth to one-eighth inch.

4,679,652

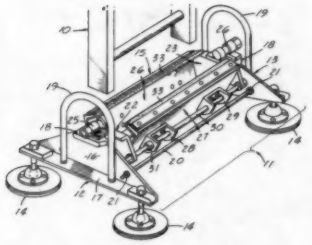
AUTOMATICALLY ADJUSTABLE LADDER SUPPORT

Ramiro E. Cervantes, Sr., 3127 Dorchester Ave., Los Angeles, Calif. 90032

Filed Mar. 17, 1986, Ser. No. 840,098

Int. Cl.[4] E06C *5/36*; E04G *1/14*

U.S. Cl. 182—200 **5 Claims**



5. A self-adjusting support for a ladder, comprising:

first and second end plates mounted in fixed predetermined spaced apart relation exceeding the width of the lower end portion of the ladder;

a pair of jaw means pivotally mounted to said first and second end plates for pivoting from a first position with the jaw means closed on each other to a second position where the jaw means are spaced apart a sufficient amount to enable receipt of the ladder lower end portion therebetween;

each jaw means includes an elongated manner with a longitudinally extending clamping surface and a longitudinally extending actuating surface spaced from said clamping surface, and each said jaw means being mounted for pivoting about a longitudinal axes from the first position where the clamping surfaces are in contact and the actuating surfaces are separated to the second position where the clamping surfaces are separated and the actuating surfaces are in contact;

coil spring means interconnecting the jaw means to each other for urging the jaw means toward the second position; and

a pair of end wall assemblies supporting the first and second end plates on a ground plane.

4,679,653

HIGHLY MANEUVERABLE INSULATED MAN LIFTING AERIAL CRANE FOR USE IN SERVICING OVERHEAD HIGH-VOLTAGE ELECTRICAL TRANSMISSION LINES

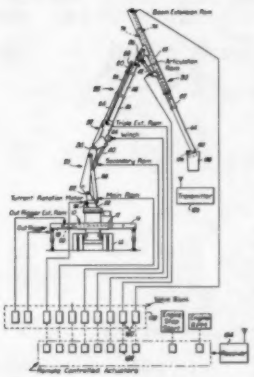
Ernest R. Pasquarette, Jr., Lee's Summit; Stanley G. Crouse, Greenwood, both of Mo.; Ermen Campanella, and Franco Boiti, both of Bergamo, Italy, assignors to Ruco Equipment Company, Inc., Kansas City, Mo.

Filed Jan. 7, 1986, Ser. No. 816,851

Claims priority, application Italy, Sep. 30, 1985, 67829 A/85

Int. Cl.[4] B66F *11/04*

U.S. Cl. 182—2 **27 Claims**



1. An electrically insulated, articulated, man-lifting aerial crane for use in servicing overhead high-voltage electrical transmission lines and the like comprising:

a vehicle providing an elevated, mobile base;

selectively operable, ground-engageable outrigger means associated with the vehicle for stabilizing the base during use;

a turret mounted on said base for selective rotary movement about a generally upright axis;

a first boom section pivotally coupled with said turret for up-and-down swinging movement;

a second boom section pivotally coupled with the first section adjacent the outer end of the latter for up-and-down swinging movement;

a third boom section pivotally coupled with said second boom section adjacent an outer end of the latter for up-and-down swinging movement,

said third section including:

a first tubular boom;

a second tubular boom telescopically housed within said first boom;

a third boom telescopically housed within said second boom,

said third boom being constructed of a dielectric matrerial capable of avoiding the transmission of electrical energy along the length thereof;

power means operably coupled with said booms of the third section for telescopically extending and retracting the same; and

a man-carrier coupled with said third boom adjacent said outer end of the latter for transporting a workman to and from an overhead electrical transmission line during operation of the crane and maintaining the workman electrically insulated from ground potential,

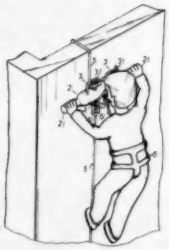
said power means being provided with control structure operable to always cause extension of said third boom to a fully extended position thereof before extension of said second boom whereby to place an outer end of the third boom at a remote location relative to the first and second booms prior to allowing extension of the second boom, said control structure further being operable to always cause retraction of the second boom into the first boom before retraction of the third boom into the second boom whereby to maintain said outer end of the third boom at said remote location until the second boom is first fully retracted.

4,679,654

DESCENDING LIFE-ESCAPING DEVICE SPECIALLY FOR A HIGH BUILDING USE

Li-Hsing Lu, 7, Ping-Taan Road, Ta-Cherng Hsiang, Changhua Hsien, Taiwan

Filed Feb. 12, 1986, Ser. No. 828,507
Int. Cl.[4] B60T *3/00*
U.S. Cl. 182—5 **5 Claims**



1. A descending life-escape device for enabling a person to escape from a life-threatening situation from a high place mainly having

a sausage-shaped and transversely-disposed weight-supporting member which is equipped with two grip handles on right and left sides thereof,

a pair of transversely positioned coil-like parts on a top side of said weight-supporting member, and

a vertically placed coil-like part on a bottom side of said weight supporting member,

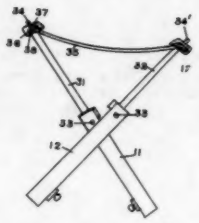
wherein said coil-like parts each include a spiral through which a vertically-hung cable to be descended by the person is wound from an open end of each spiral, said coil-like parts being provided on said weight-supporting member so that said cable passes through said device in a winding manner and frictionally contacts with all of said coil-like parts and a front side of said weight-supporting member, so that the descending speed of a person can be reduced by control of the descending person to bring said person to ground safely.

4,679,655

CONVERTIBLE STAND

Daniel F. Behring, 2519 Tenth St., Monroe, Wis. 53566

Filed Oct. 14, 1986, Ser. No. 918,146
Int. Cl.[4] A47C *9/10*; A01M *31/02*
U.S. Cl. 182—33 **6 Claims**



1. Portable, pivotally cross toggled grate means for use as tool or table legs or tree platform, comprising,

(a) furcated grate means embodying a plurality of rigid elongated parallel finger portions having integrally incorporated therein first hinge structure component means disposed axially perpendicular to said finger portions,

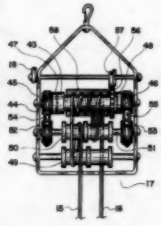
(b) means embodying a rigid elongated portion interspaced between at least two said finger portions having integrally incorporated therein second hinge structure component means complementary to that of said first hinge structure component means wherein said first component means and said second component means are selectively engaged to provide pivotal connection between said grate means and said member means at any of multiple linearly separated locations.

4,679,656

SKY-RIDE VERTICAL MOBILITY DEVICE

Hyok S. Lew; Hyon S. Lew, and Yon K. Lew, all of 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 711,318, Mar. 13, 1985, which is a continuation-in-part of Ser. No. 682,673, Dec. 17, 1984, Pat. No. 4,598,792, which is a continuation-in-part of Ser. No. 676,400, Nov. 29, 1984, Pat. No. 4,598,793. This application Nov. 12, 1985, Ser. No. 797,411
Int. Cl.[4] A62B *1/08*
U.S. Cl. 182—42 **14 Claims**



8. A vertical mobility device for transporting a person or object in vertical directions comprising in combination :

(a) a first cylindrical member rotatably and nonshiftably secured to a supporting structure including a means for securing said supporting structure to an elevated structure;

(b) a second cylindrical member rotatably and nonshiftably secured to said supporting structure in a substantially parallel configuration with respect to said first cylindrical member;

(c) a third cylindrical member rotatably and shiftably secured to said supporting structure intermediate said first and second cylindrical members in a substantially parallel configuration with respect to said first cylindrical member;

(d) a cord member wound on said first cylindrical member over at least one complete lap, wherein one portion of said cord member extending from one side of the cylindrical surface of said first cylindrical member loops over the combination of said third and first cylindrical members over at least one complete loop, and the other portion of said cord member extending from the other side of the cylindrical surface ..aid first cylindrical member loops over the combination of said second and third cylindrical members over at least one complete loop;

(f) cord guide means for guiding said cord member wound on said first cylindrical member wherein said cord guide means enhances smooth looping movements of said cord member;

(g) a ratchet mechanism linked to said cylindrical member, said ratchet mechanism preventing said cylindrical member from rotating in a direction resulting in looping motion of said cord member releasing said one portion of said cord member and taking up said the other portion of said cord member when said ratchet mechanism is activated;

(h) means for activating and deactivating said ratchet mechanism, said means operatable by a manual shifting mechanism; and

(i) at least one securing means affixed to said one portion of said cord

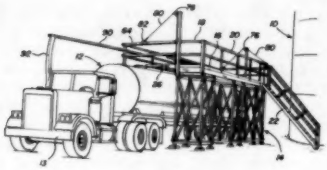
member for securing a harness; whereby, a person or persons wearing a harness secured to said at least one securing means affixed to said one portion of said cord member can remain suspended in midair or lower oneself at a safe speed by exerting a small amount of pull on said the other portion of said cord member as said braking plus said small amount of pull on said the other portion of said cord member substantially counter balances pull on said one portion of said cord member created by the weight of said person or persons secured to said one portion of said cord member when said ratchet mechanism is deactivated.

4,679,657

MOBILE TANK VEHICLE ACCESS SYSTEM

Ronald W. Bennett, Florence, and Ellie H. MacDonald, Timmonsville, both of S.C., assignors to Aluminum Ladder Company, Florence, S.C.

Filed Jan. 23, 1986, Ser. No. 821,805
Int. Cl.[4] E04G *1/26, 1/28*
U.S. Cl. 182—113 **11 Claims**



1. A mobile tank vehicle access system including an elevated platform defining one elongated marginal portion, a generally planar extension panel including a base marginal edge pivotally mounted from said marginal portion for angular displacement relative thereto about an axis extending along said marginal portion and base marginal edge between a raised upstanding inoperative poistion and a lowered position extending at least generally horizontally outwardly of said marginal portion, said extension panel including a free marginal edge opposite said base marginal edge for engaging, resing against and extending along the near side of the top of an elongated tank body disposed outward of an generally parallelling said one marginal portion and including central tank interior access means spaced along the tank body disposed at least slightly outward of said free marginal edge, an elongated upstanding railing structure swingably mounted from said platform for movement between a raised upwardly and inwardly retracted position and lowered outwardly extended position relative to said one marginal portion, said railing structure generally parallelling said free marginal edge when said railing structure and a panel are in the lowered poistions thereof and being spaced a distance outward from said free marginal edge sufficient to receive said tank interior access means between said free marginal edge and said railing structure, first means connected between said platform and railing structure for raising and lowering said railing structure independent of raising and lowering said extension panel, a second extension panel corresponding to the first mentioned extension panel and spaced along said one elongated marginal portion from the first mentioned panel, elongated access ramp means including a base end, means pivotally mounting said base end from said one elongated marginal portion between the first mentioned extension panel and said second extension panel for swinging about an axis extending along said one elongated marginal portion and angular displacement of said access ramp means between a raised inoperative position and an outward and downwardly inclined operative position with the free and thereof engaged with and supported from said near side of the top of said tank body, said one elongated marginal portion including a lower upstanding fence projecting upwardly therefrom immediately inwardly of each of said extension panels, each fence terminating upwardly in a horizontally outwardly projecting safety panel.

4,679,658

GAFF

Harlan Demers, Dalton, Ohio, assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1985, Ser. No. 751,872
Int. Cl.[4] A63B *27/00*
U.S. Cl. 182—221 **11 Claims**

1. A gaff for use in a climbing iron for climbing a wooden pole or tree, said gaff having at least one groove on the part of the gaff that is inserted into the pole or tree wherein the gaff has a plurality of grooves and the gaff is prismatic in shape and has two top sides and a line formed by the intersection of the planes of said two top sides and grooves along a line parallel to the line formed by said intersection.

4,679,659

METHOD AND APPARATUS FOR LUBRICATING A MOVING CHAIN

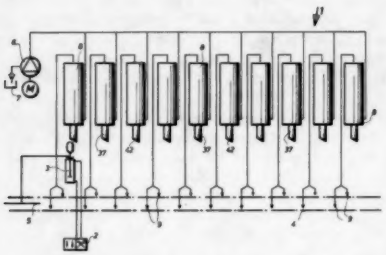
Manfred Jendick, Recklinghausen, Fed. Rep. of Germany, assignor to GerroKaiser Dosenwerk GmbH & Co KG, Fed. Rep. of Germany

Continuation of Ser. No. 671,696, Nov. 15, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 875,503

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341658

Int. Cl.[4] F16N *13/02*

U.S. Cl. 184—15.2 10 Claims



1. Apparatus for periodically applying a selected amount of a liquid lubricant onto a rapidly moving chain having a number of spaced lubrication points thereon, a driving chain wheel, said chain being guided by said driving chain wheel, a plurality of spaced apart lubricant applicator nozzle units each arranged to direct lubricant on to different said lubrication points on said chain, a plurality of cam-actuated piston pumps each arranged for supplying a lubricant to a different one of said units, an axially extending driving shaft having at least one governing cam thereon arranged for operating said lubricant pumps, wherein the improvement comprises:

(a) means for interengaging said driving shaft and said driving chain wheel so that the torque from said driving chain wheel is transmitted to said driving shaft whereby said driving shaft is driven by said chain wheel at the same speed as said chain,

(b) said piston pumps are arranged stationary and disposed in a semi-circular arrangement in angularly spaced relation in a single radial plane extending transversely of the axial direction of said driving shaft, and said at least one governing cam projects radially outwardly from said driving shaft and rotates in a circle moving past the stationary said piston pumps, said piston pumps comprising a first said piston pump, a last said piston pump and a number of intermediate said piston pumps located between the first and the last said piston pumps,

(c) an oil distributor,

(d) each said piston pump has a pump head, a pressure chamber within said pump head, said pressure chamber has a first end and a second end with an inlet intermediate the ends thereof for receiving the lubricant from said oil distributor and an outlet at the first end thereof for directing the lubricant to the associated said nozzle unit, an axially extending piston extending into the second end of said pressure chamber and being axially displaceable therein, said piston having one end located outside said pressure chamber and a deflecting cam located on said one end of said piston, means for displacing said piston away from the first end of said pressure chamber, said governing cam arranged to contact said deflecting cam on said piston and to displace said piston toward the first end of said pressure chamber to open said first check valve for discharging lubricant and when said governing cam releases said deflecting cam said displacing means returns said piston toward the second end of said chamber establishing a suction within said chamber for opening said second pressure valve and filling the pressure chamber with the selected amount of liquid lubricant whereby said second check valve closes when the filling operation is completed for maintaining the selected quantity of lubricant within said pressure chamber until said piston is again displaced by the cooperating action of said governing cam and deflecting cam, and

(e) said at least one governing cam comprises a first said governing cam and a second said governing cam angularly offset relative to one another around said driving shaft with the spacing therebetween corresponding to the spacing between the first and the last said piston pumps, so that during rotation of said driving shaft the first said governing cam contacts said deflecting cam of the first said piston pump and the second said governing cam contacts the deflecting cam of the last said piston pump.

4,679,660

MECHANISM FOR AUTOMATICALLY STORING SWING ARMS USED FOR APPARATUS FOR LIFTING AUTOMOBILES FOR REPAIR

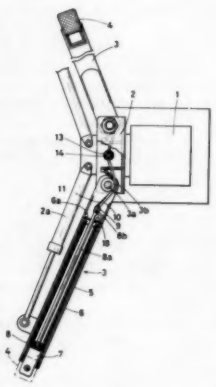
Koichi Suzuki, Aichi, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan

Filed Jul. 18, 1986, Ser. No. 887,991

Claims priority, application Japan, Aug. 3, 1985, 60-133829[U]

Int. Cl.[4] B60S *13/00*

U.S. Cl. 187—8.41 2 Claims



1. In an apparatus for lifting automobile for repair thereof, comprising a pair of spaced apart posts each having a carriage which is connected thereto for vertical movement and each carriage includes a pair of horizontal swing arms pivotally connected thereto for swinging movement in a horizontal plane, each of said swing arms having a car body support means at its one end, and comprising at least two arm elements, wherein one of said arm elements comprises a substantially horizontal hollow support arm element connected to a pivot pin of said carriage and the other of said arm elements comprises a substantially horizontal telescopic arm element supported by said support arm element and slidable therein so as to extend therefrom or retract thereinto in a horizontal plane, an improvement characterized in that:

a. said slidable or telescopic arm element is a hollow element closed at the end thereof nearer to said carriage and having a hollow cylinder therein;

b. a hollow piston rod passes through said closed end of slidable arm element, a portion of said piston rod extending in said hollow cylinder and the other portion thereof extending in said hollow support arm element;

c. said hollow piston rod is opened at its both ends;

d. a piston is connected to the open end of said hollow piston rod in said cylinder, said piston being slidable in said cylinder;

e said piston and said closed end of said slidable arm element defines an air chamber between them in said cylinder;

f. a pressurized-air supply means is connected, through an air hose, to the open end of said hollow piston rod in said support arm element, so that the air under pressure may be supplied from said supply means through said hollow piston rod into said air chamber, thereby moving slidable arm element and said piston relative to each other;

g. said piston rod is also connected to said carriage by means of an interconnection means which is fixed, at its one end, to the end of said piston rod in said support arm element and is engaged, at a portion of its middle section, with a portion of said pivotal pin of said carriage and is secured to another portion, excepting said pivotal pin, of said carriage; and

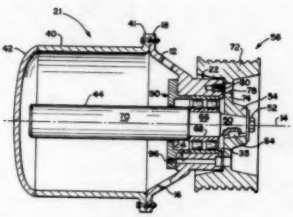
h. said support arm element is provided, on its inner surface, with a means for preventing said slidable arm element from moving or sliding, in said support arm element, toward the carriage beyond a given point.

4,679,661

MODULAR GEARLESS ELEVATOR DRIVE

William H. Gibson, Aurora, Colo., assignor to Otis Elevator Company

Filed Feb. 24, 1986, Ser. No. 832,198
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—20 **3 Claims**



1. A drive arrangement including a motor and a sheave wherein:

the front endcap **(10)** of the motor comprises a concave disc-like portion **(12)** that is centered about the motor axis and a tubular boss **(22)** extending axially outwardly from the center of the disc-like portion **(12)**; wherein the boss **(22)** has a cylindrical bore portion **(36)**, a front surface **(25)**, and threaded holes **(80)** extending axially inwardly from the front surface **(25)** into the boss **(22)**;

the sheave **(56)** comprises an outer rim portion **(72)** connected via an intermediate disc portion **(74)** to an inner hub portion **(54)**; wherein holes **(78)** are provided axially through the intermediate disc portion **(74)** in ultimate alignment with the threaded holes **(80)** when the sheave **(56)** is assembled to the boss **(22)** and wherein the outer rim portion **(72)** extends over the boss **(22)** with a tight running clearance therebetween so that the sheave **(56)** and the front endcap **(10)** are held in close axial alignment when the sheave **(56)** is bolted to the front endcap **(10)** via bolts through the holes **(78)** in the sheave **(56)** and the threaded holes **(80)** in the boss **(22)**;

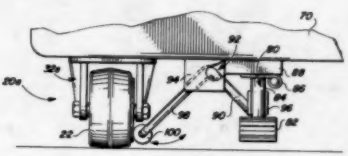
the motor **(21)** comprises a tubular housing **(40)** and a shaft **(44)** extending axially out the front of the housing **(40)**; wherein a first portion **(50)** of the shaft **(44)** is disposed to extend past the boss **(22)** for receiving the hub portion **(54)** of the sheave, and wherein a second portion **(66)** of the shaft **(44)** is disposed substantially within the boss **(22)** in correspondence with the cylindrical bore portion **(36)** of the boss **(22)** for receiving a bearing **(68)** between the second shaft portion **(66)** and the cylindrical bore portion **(36)**.

4,679,662

LIGHTWEIGHT AIRCRAFT FURNITURE CASTER ASSEMBLY HAVING A NOTCHED BRAKING PLATE ENGAGED BY A BRAKE

Robert A. Nordskog, 18135 Karen Dr., Tarzana, Calif. 91356

Filed Nov. 8, 1985, Ser. No. 796,066
Int. Cl.[4] B60B *33/00*
U.S. Cl. 188—1.12 **5 Claims**



1. An improved lightweight aircraft furniture caster assembly, said assembly comprising, in combination:

(a) a lightweight aircraft furniture caster wheel consisting essentially of lightweight material, said wheel having transverse cut-away portions to reduce the overall weight of said wheel; and,

(b) a generally inverted U-shaped lightweight caster wheel support bracket releasably connected to said wheel for free rotation of said wheel, said bracket consisting essentially of lightweight material wherein said wheel includes a plurality of spaced passageways symmetrically disposed around a central hub of said wheel, and extending transversely and completely through said wheel, said passageways having reinforcing rods releasably secured therein to dimensionally stabilize and strengthen said wheel;

(c) wherein said assembly includes braking means and a lightweight braking plate releasably connected to said wheel wherein said breaking plate is metallic, is generally circular, has two side surfaces and an outer periphery and includes semicircular notches at said outer priphery, said wheel having two sides, said braking plate being secured by said reinforcing rods to one of the sides of the wheel, a separate braking mechanism releasably bears against one of the side surfaces of the braking plate, wherein said one of the side surfaces faces in the same direction as said one of said sides, said braking mechanism comprising an element which frictionally engages said one of said side surfaces to slow the rotation of said wheel, said element fits within one of the notches to lock the wheel in a stopped position.

4,679,663

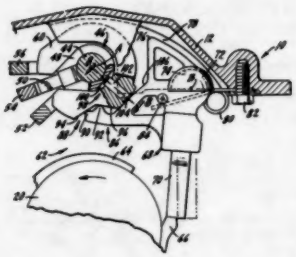
TRANSMISSION ANTI-CLASH AND ANTI-RATTLE BRAKE

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 584,567, Feb. 29, 1984, Pat. No. 4,584,894.
This application Nov. 25, 1985, Ser. No. 802,104
Int. Cl.[4] F16D *63/00*; **F16M** *57/10*; **B60K** *41/26*
U.S. Cl. 188—82.1 **6 Claims**

1. A brake comprising friction means adapted for movement with an element to be braked, an arm movable into the path of said friction means to prevent movement thereof with said element such that it applies a frictional braking force to said element, said arm being movable out of said path to allow movement of said friction means with said element such that it does not apply a frictional braking force thereto, means for moving said arm into said path, control means movable in one plane to a plurality of positions and movable in another plane

from each of said positions, said brake being constructed and arranged such that said arm is in said path and said brake is applied when said control means is in one of said positions, and



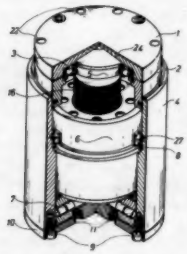
means for moving said arm out of said path in response to movement of said control means in either plane from said one of said positions.

4,679,664

BLANKING IMPACT ABSORBER

Carsten Rosendal, 1 Ostergade, 2. sal, DK-7400 Herning, Denmark

Continuation of Ser. No. 685,892, Dec. 24, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 912,656
Claims priority, application Denmark, Dec. 27, 1983, 5986-83
Int. Cl.[4] B60T 7/12
U.S. Cl. 188—134 5 Claims



1. A blanking impact absorber for a press like machine tool having a stationary member and a movable member between which a workpiece may be positioned, said impact absorber comprising:

a housing fixed to one of said stationary and movable members of said machine tool;

a flywheel mounted in said housing by means for permitting only rotation of said flywheel about a rotational axis;

a spindle extending coaxially with said rotational axis and mounted by means for permitting rotation about said axis and movement along said axis;

means for rotating said flywheel in response to movement of said spindle along said rotational axis and for movement of said spindle along said rotational axis in response to rotation of said flywheel, whereby energy of movement is transformed from said machine tool to said flywheel and back again;

a cover fixed to the other of said stationary and movable members of said machine tool and being connectable with said spindle for transferring pressing and tensile forces between said cover and said spindle;

clutch means for preventing rotation of said spindle about said rotational axis in response to a pressing force on said cover along said axis and for allowing rotation of the spindle about said rotational axis in response to a tensile force provided from said rotating flywheel, said tensile force provided from said rotating flywheel being greater than tensile forces arising during idling of said press-like machine tool; and

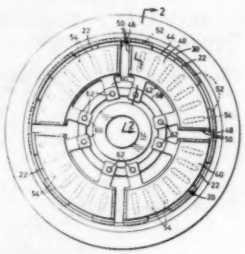
means for braking rotation of said spindle about said axis, whereby energy of rotation of said flywheel is dissipated.

4,679,665

BRAKE DISC DESIGN FOR WHEEL MOUNTED DISCS

Roy E. Smith, Kingston, Canada, assignor to Urban Transportation Development Corporation Ltd., Canada

Continuation of Ser. No. 615,646, May 31, 1984, abandoned. This application Feb. 21, 1986, Ser. No. 831,740
Claims priority, application Canada, Mar. 12, 1984, 449348
Int. Cl.[4] F16D 65/12
U.S. Cl. 188—218 XL 15 Claims



1. A disc brake assembly, comprising:

a wheel having a hub for mounting said wheel for rotation about an axis, a rim, and a web,

a disc to be engaged by a brake pad, said disc comprising a plurality of annular disc segments, each of said disc segments having a leading edge, a trailing edge, a radially inner edge and a radially outer edge,

each of said disc segments having at least two spaced apart mounting tangs adjacent said radially inner edge,

said mounting tangs adapted to restrain substantially all centrifugal force applied to said segment when said assembly rotates about said axis,

at least one retention tang adjacent said radially outer edge of each of said disc segments,

each of said disc segments having abutment means adjacent said leading and trailing edges, said abutment means contacting said web of said wheel,

said wheel having a flange adjacent said rim spaced from said web and projecting radially toward said hub for engaging said at least one retention tang of each of said disc segments, and

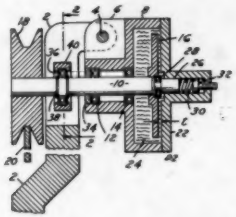
fastening means for fixing each of said disc segments to said wheel,

wherein said retention tangs project between said web and said flange of said wheel when said disc segments are fastened in place, said retention tangs are radially spaced from said rim and engage said flange so that said disc segments can freely expand radially away from said hub under the effect of heat generated during braking but may not move axially with respect to said web, and said retention tangs are radially movable relative to said flange when said disc segments expand radially outward under the effect of heat generated during braking.

4,679,666
WEIGHT RESPONSIVE ROTARY RETARDATION DEVICE

John H. Brems, Apt. 11-G, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Dec. 4, 1981, Ser. No. 327,516
Int. Cl.[4] F16D 57/00
U.S. Cl. 188—290 14 Claims



1. In a system in which a carrier or pallet for a weight to be supported is moved by gravity down an inclined track whereby the velocity of movement is retarded by a rotary device for angular velocity control in which the retarding torque is substantially proportional to the angular velocity, and which utilizes the shearing of a viscous fluid to create said retarding torque, that improvement which includes weight responsive means to increase said retarding torque in response to the increase in a weight supported by said carrier, comprising:

(a) a first torque means,

(b) a second torque means mounted for rotation relative to, and with variable proximity to, said first torque means,

(c) viscous fluid means positioned between said first and second torque means,

(d) elastic means acting between said first and second torque means biased to separate said first and second torque means, and

(e) connecting means operating between said first and second torque means and responsive to said supported weight to increase the proximity of said torque means in response to an increased supported weight,

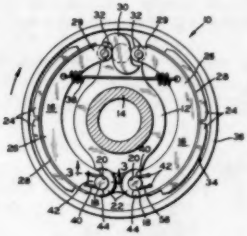
whereby a relative rotational movement between said torque means causes an internal shearing of said viscous fluid means creating a retarding torque substantially proportional to the angular velocity of said relative rotational movement, and said internal shearing of said viscous fluid means is increased by an increase of proximity of said torque means in response to an increase of said supported weight creating an increase in said retarding torque in response to an increase in said supported weight.

4,679,667
ANCHOR PIN RETAINER

Frank W. Zawodni, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 28, 1985, Ser. No. 792,074
Int. Cl.[4] F16D 65/04
U.S. Cl. 188—341 10 Claims

1. In a brake assembly of the type including a brake drum, a pair of brake shoes including a pair of webs supporting each of said shoes, said webs having adjacent ends pivotally mounted to a pair of anchor pins, and actuating means disposed between the opposite ends of said shoes to pivot said shoes into frictional contact with said drum; an improvement comprising a pair of unitary retainers engaging each of said anchor pins, a first retainer of each pair of retainers being located adjacent one web of each said pair of webs and a second retainer of each pair of retainers being located adjacent the other web of each said pair of webs, each retainer including an arcuate portion partially encircling a respective one end of one of said anchor pins, each retainer comprising a pair of spaced legs, each leg having an integral hook on the end thereof in engagement with one of said webs, said spaced legs being substantially parallel, said legs extending in the same direction from opposed sides of

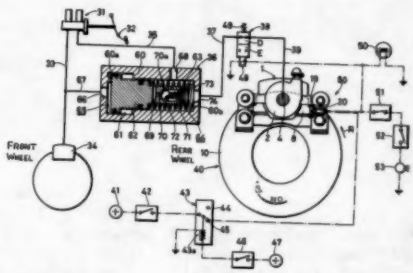


said arcuate portion of said retainer whereby each of said pairs of web is circumferentially retained by one of said pairs of retainers against one of said anchor pins.

4,679,668
BRAKE CONTROL APPARATUS FOR A VEHICLE

Shoichi Washizu; Takeshi Morijiri; Kazuo Kogure, all of Gunma, and Satoshi Arimitsu, Kanagawa, all of Japan, assignors to Fuji Heavy Industries Ltd., Tokyo and Nippon Air Brake Co., Ltd., Kobe, both of, Japan

Filed Apr. 22, 1986, Ser. No. 855,082
Claims priority, application Japan, Apr. 25, 1985, 60-90494
Int. Cl.[4] B60T 11/28
U.S. Cl. 188—353 10 Claims



1. A brake control apparatus for a vehicle comprising:

(A) brake apparatus for the respective wheels which are operated by pressurized fluid from a master cylinder;

(B) an electro-magnetic valve arranged in a conduit connecting said master cylinder with at least one of said brake apparatus, said electro-magnetic valve being normally in the communicating state and being changed over into an intercepting state by as external instruction;

(C) at least one of said brake apparatus being of the disc brake type, said one comprising;

(a) a disc rotor;

(b) first and second friction pad assemblies for engagement with opposite sides of said disc rotor, said assemblies being guided for movement towards said disc rotor;

(c) a caliper body straddling the peripheral edge of said disc rotor and said first and second friction pad assemblies;

(d) actuating means arranged in said caliper body for urging said first and second friction pad assemblies into engagement with said disc rotor; and

(e) elastically deformable retainers for supporting said first

and second friction pad assemblies in the peripheral direction:

(D) at least one of said first and second friction pad assemblies being displaceable within a predetermined range in the peripheral direction in accordance with the change of the direction of the frictional force with said disc rotor; and

(E) a switch movable by said peripheral displacement of said one friction pad assembly for generating said external instruction for said electro-magnetic valve.

4,679,669

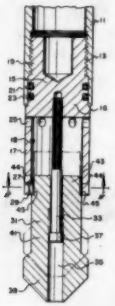
SHOCK ABSORBER

Gerald F. Kalb, North Richland Hills, and David M. Brown, Fort Worth, both of Tex., assignors to S.I.E., Inc., Fort Worth, Tex.

Filed Sep. 3, 1985, Ser. No. 771,902

Int. Cl.[4] F16F 7/12

U.S. Cl. 188—375 **12 Claims**



1. A shock absorber for a wireline instrument for use in a liquid containing well to reduce sock if the instrument impacts on an object while being lowered, said shock absorber comprising:

a sleeve, having an inner surface;

a mandrel, telescopically movable within the sleeve from an outward extended position to an inward retracted position if a sufficient impact of the instrument occurs, the mandrel having an outward portion with a smooth cylindrical surface and an inward portion located inward of the outward portion, which has a polygonal cross section with a plurality of flat sides defining an annular shoulder between the inward and outward portions;

means for connecting the sleeve and mandrel to the wireline instrument; and

a plurality of separate cutting elements, each mounted on the inner surface of the sleeve, each cutting element having a flat cutting edge in contact with one of the flat sides of the inward portion of the mandrel and bearing against the shoulder, each cutting element being mounted at a rake angle which is negative with a cutting edge inclined outwardly toward the outward portion of the mandrel and into the material being cut for cutting chips of material off of the outward portion of the mandrel as the mandrel is moved inward into the sleeve due to an impact.

4,679,670

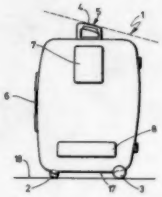
WHEELED SUITCASE AND HANDLE

John A. Wickman, Swansea, Mass., assignor to American Tourister, Inc., Warren, R.I.

Continuation of Ser. No. 705,956, Feb. 27, 1985, abandoned. This application Jul. 15, 1986, Ser. No. 885,811

Int. Cl.[4] A45C 5/14, 13/26

U.S. Cl. 190—18 A **11 Claims**



1. An improved suitcase of the shape of a hollow, generally rectangular solid which comprises:

(a) two generally vertical parallel side panels having two generally vertical edges and two generally horizontal edges;

(b) two generally vertical parallel end panels having two generally vertical edges and two generally horizontal edges and being attached along the generally vertical edges thereof to the vertical edges of said side panels;

(c) a generally horizontal top panel having a generally rectangular shape and being attached along its edges to the upper generally horizontal edges of said side panels and said end panels;

(d) a generally horizontal bottom panel having a generally rectangular shape and being attached along its edges to the lower generally horizontal edges of said side panels and said end panels;

(e) at least two spaced apart rear wheels movably mounted to said bottom panel at one end thereof and in a direction generally parallel to said side panels, said rear wheels protruding at least partially below the said bottom panel;

(f) at least one front wheel movably mounted to said bottom panel at the other end thereof in a direction generally parallel to said side panels, said at least one front wheel protruding at least partially below the said bottom panel, the diameters of said at least two rear wheels being greater than the diameter of said at least one front wheel, and said at least one front wheel being on the leading position of said bottom panel during transport of said suitcase upon said wheels;

(g) a first handle means attached to one of said end panels, said first handle means being adapted to allow carrying of said suitcase without the use of said front and rear wheels; and

(h) a second handle means attached to said top panel and being adapted for movement of said suitcase on said front and rear wheels, said second handle means comprising a front riser section at the leading portion thereof, a rear riser section at the following portion thereof, and a gripping section intermediate and connected to said front and rear riser sections, said front riser section being of a length greater than the length of said rear riser section, with the distance between said gripping section and said top panel of said suitcase increasing in the direction of movement of said suitcase when transported upon said wheels by means of a manual force applied to the gripping section of said suitcase through said handle, the angle of inclination of said gripping section being away from the normal direction of travel of said suitcase and toward said rear wheels.

4,679,671

BAND CLAMPING DEVICE FOR LUGGAGE TRANSPORTATION

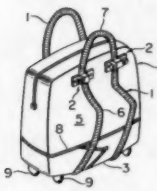
Hiroshi Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Sankodo, Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,460

Claims priority, application Japan, Jul. 5, 1984, 59-100698[U]; Aug. 31, 1984, 59-131483[U]; Dec. 28, 1984, 59-196865[U]

Int. Cl.[4] A45C *13/30*

U.S. Cl. 190—115 12 Claims



1. An assembly of a pair of band clamping devices for being mounted horizontally spaced from each other on at least one side of luggage to be carried to clamp a luggage carrying band in an inverted U-shaped configuration to form handle portions on an upper side of the clamping devices and parallel carrying portions on the lower side of the clamping devices, each clamping device comprising:

a base through which the band may pass orthogonally,

said base having a horizontally elongated base plate fixed on the side of the luggage, and

an elongated frame integral with and perpendicular with respect to said elongated base plate,

said elongated frame having upper and lower elongated openings respectively adjacent to said base plate, and

an elongated main opening communicating with said pair of elongated openings and laterally opening with respect to said base,

said elongated main opening and said elongated lower and upper openings having a length longer than the width of the band to form an internal passage to allow the band to orthogonally pass through said base portion,

a fitting for mounting on the base,

said fitting having a central bracket portion engaging and retaining a portion of the band in said elongated main opening at a position nonaligned with respect to said lower and upper openings, and

having a pair of leg portions formed integral with said bracket portion and horizontally slidable along the outside of said elongated frame of said base portion,

said elongated openings being sufficiently longer than the width of the band and the fitting such that the band is laterally adjustable with respect to the other band clamping device,

whereby the length of the handle portions of the inverted U-shaped band and the length of the parallel portions of the band and the distance between the parallel portions of the band may be manually adjusted to facilitate insertion of the arms and shoulders of a carrier of the luggage, and after the manual adjustment the carrying band may be clamped by pulling the parallel portions of the band.

4,679,672

OVERHEAD ELECTRIC TRACTION SYSTEM FOR RAILWAYS

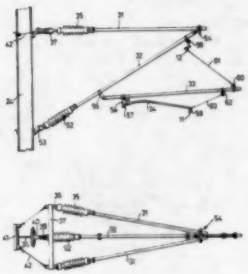
Alan E. Seddon, Rainford, and John Doughty, Wigan, both of England, assignors to BICC Public Limited Company, London, England

Filed Jan. 30, 1986, Ser. No. 824,076

Claims priority, application United Kingdom, Jan. 30, 1985, 8502336

Int. Cl.[4] B60M *1/22;* E04C *3/02;* H02G *7/20*

U.S. Cl. 191—41 5 Claims



1. In an overhead electric traction system in which at least one overhead conductor at longitudinally spaced positions along its length is suspended from cantilever structural assemblies and in which sections of one flexible member of the system, selected from the group of flexible members consisting of said overhead conductor of the system and a catenary, twin catenaries, and a main catenary by which the conductor is supported, are each maintained under tension by balance weights supported by upstanding supports of cantilever structural assemblies at the ends of said section, a mid-point anchor which is positioned at approximately the mid-point of at least one section of the system and which comprises an upstanding support positioned alongside the route of the system and, mounted on an upper part of the upstanding support, a cantilever structure comprising a pair of substantially rigid elongate members which lie in a substantially common plane and extend transversely with respect to and are spaced apart in a direction lengthwise of the route, which at their ends nearer the route are connected to said upstanding support by a third transversely extending elongate member inclined at an acute angle to said common plane, and which at their ends remote from the route are connected to opposite ends of a fourth substantially rigid elongate member which extends lengthwise of the route and which, at each of its end portions, is connected to said upstanding support by an elongate element, the arrangement being such that, in the event of an unbalanced load on said flexible member pivotal movement of the cantilever structure about a substantially vertical axis is prevented by one of the elongate elements and the unbalanced load is transferred to the upstanding support as a torsional load.

4,679,673

MARINE REVERSING CLUTCH ASSEMBLY

Kojiro Yamaoka, Nishinomiya; Kazuhiko Yano, Toyonaka, and Kazuhiko Ohtsuki, Takarazuka, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Dec. 6, 1985, Ser. No. 805,609

Claims priority, application Japan, Jan. 14, 1985, 59-4710

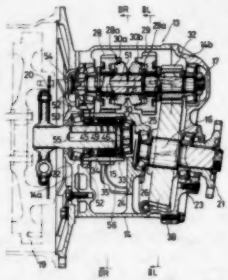
Int. Cl.[4] F16D *21/04, 11/06;* F16H *3/14;* B63H *23/08*

U.S. Cl. 192—21 5 Claims

1. A marine reversing clutch assembly for use in boats between an engine, mounted in a stern portion of the hull of a boat with the output end of the engine directed towards the stern, and a propeller shaft extending backwardly and down-

wardly from the hull, the reversing clutch assembly comprising:

a clutch casing in which are journaled an output shaft having a fore end positioned within said casing, and an aft end extending backwardly and downwardly from said casing, an input shaft having a fore end, and an aft end, said input shaft aft end extending into said casing, and a clutch shaft and an intermediate shaft located within the casing; the input/clutch and intermediate shafts being substantially parallel and the aft end of said input shaft and the fore end of said output shaft facing each other with a small gap therebetween, said output shaft being inclined with respect to said input shaft, said clutch shaft being arranged above said input and output shafts and said intermediate shaft being arranged at a level between those of said clutch shaft and said input shaft; and



the clutch shaft having thereon rotatable forward and reverse drive gears, a clutch means disposed between said forward and reverse drive gears and being operative to couple selectively one of said gears to said clutch shaft, and an output gear fixedly mounted on an aft end portion of said clutch shaft, said forward drive gear meshing with a driving gear drivably mounted on said input shaft, and said driving gear meshing with one of two gears on said intermediate shaft the other of said two gears meshing with said reverse drive gear, and said output shaft having thereon an output gear meshing with said output gear of said clutch shaft the output gear of said clutch shaft being smaller than said output gear of said output shaft and one of said output gear being formed as a conical gear.

4,679,674

SYSTEM FOR ENGAGING AN ELECTROMAGNETIC CLUTCH UPON ACCELERATION OF AN ENGINE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Dec. 18, 1984, Ser. No. 682,976

Claims priority, application Japan, Dec. 22, 1983, 58-243452

Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.052 **11 Claims**

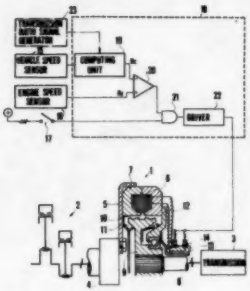
1. In a system for controlling clutch torque for a vehicle having an engine, a transmission, and an electromagnetic clutch between the engine and the transmission, the clutch having a drive member and a driven member driven by said drive member when the clutch is engaged, the clutch being automatically completely disengaged when vehicle speed decreases below a predetermined value, the improvement comprising:

means for controlling the clutch when accelerating the vehicle, after deceleration, from a low speed driving condition where the vehicle speed is below the predetermined value where the clutch is completely disengaged, so that the clutch remains completely disengaged until said controlling means completely engages the clutch when engine speed substantially equals speed of the driven member of the clutch, comprising:

first means for determining engine speed;

second means for determining the speed of the driven member of said electromagnetic clutch of a completely disengaged condition of the clutch;

third means for detecting acceleration of said vehicle and producing an acceleration signal when said acceleration is detected;



fourth means for comparing said engine speed with said speed of said driven member and producing an output when both the speeds substantially coincide with each other; and

fifth means responsive to occurrence simultaneously of said acceleration signal and said output for completely engaging said electromagnetic clutch which heretofore was completely disengaged.

4,679,675

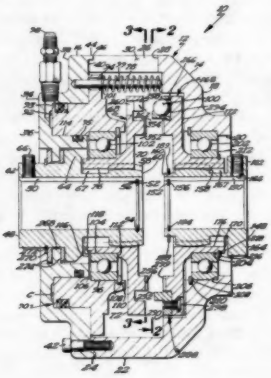
COUPLING CLUTCH

James V. Hanks, Robbinsdale; Charles D. Raines, Blaine, and Leonid Dayen, Plymouth, all of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 761,196, Jul. 31, 1985, Pat. No. 4,633,991, and a continuation-in-part of Ser. No. 715,736, Mar. 25, 1985, Pat. No. 4,624,356, and a continuation-in-part of Ser. No. 630,374, Jul. 12, 1984, Pat. No. 4,606,447. This application Dec. 9, 1985, Ser. No. 806,661

Int. Cl.[4] F16D *11/04*

U.S. Cl. 192—67 R **16 Claims**



1. A coupling clutch comprising, in combination: a first hub

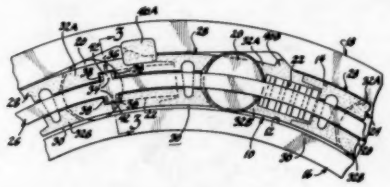
for receipt of a first shaft in a non-rotatable condition; a second hub for receipt of a second shaft in a non-rotatable condition; a first disc; means for slideably mounting the first disc on the first hub; means for biasing the first disc in a first axial direction towards a first axial position on the first hub; means for moving the first disc in the opposite axial direction towards a second axial position; a second disc, with the second disc being selectively engageable with the first disc to rotatably relate the first disc and the second disc; means for slideably mounting the second disc on the second hub; and means for substantially preventing slideable movement of the second disc with respect to the second hub and for allowing canting of the second disc with respect to the second hub to take up angular misalignment of the first and second shafts; with the means for slideably mounting the first disc on the first hub comprising, in combination: crown splines formed on the first hub; and splines formed in the first disc complementary to and for slideable receipt on the crown splines of the first hub; with the means for slideably mounting the second disc on the second hub comprising, in combination: crown splines formed on the second hub; and splines formed in the second disc complementary to and for slideable receipt on the crown splines of the second hub, wherein the crown splines on the hubs allow further canting of the discs with respect to the hubs to take up considerable more angular misalignment of the first and second shafts with the substantially equal rotational backlash.

4,679,676

OVERRUNNING CLUTCH CAGE WITH SIMPLIFIED MANUFACTURE

Donald J. King, Huron, and Frederick E. Lederman, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1986, Ser. No. 872,854
Int. Cl.[4] F16D *41/06;* F16C *33/46*
U.S. Cl. 192—45 **3 Claims**



1. An overrunning clutch cage assembly of the type that retains metal wedging elements and is adapted to be installed in an annular space between confronting surfaces of a pair of rotatable members, said clutch cage providing for ease of manufacture, comprising,

a cage body including a plurality of circumferentially spaced support portions adapted to fit closely within said annular space and to slidably engage one of said confronting surfaces when said clutch overruns so as to maintain said rotatable members in coaxial relation to one another, said cage body being formed of a moldable plastic material so as to provide support portions with desirable frictional properties,

said cage body also including a plurality of connector portions circumferentially interconnecting said support portions and also formed of said moldable plastic material, so that said cage body may be molded as an easily handled unitary structure, with each connector portion being just sufficiently strong to temporarily maintain said support portions interconnected, and,

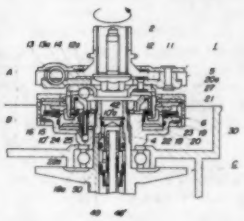
a pair of metal end rings adapted to be joined to said unitary cage body in axially spaced relation, thereby forming a plurality of armored wedging element retention pockets in cooperation with said support portions, said joinder of said end rings acting to fracture said connector portions while maintaining the support portions in substantially their original circumferentially spaced relation, thereby allowing said support portions of the completed cage assembly to operate independently after said cage assembly is installed.

4,679,677

HYDRAULIC TYPE STARTING CLUTCH

Kohei Ohzono, Fujimi; Kiyotaka Hayashi, Urawa; Mitsuru Saito, Koganei; Masaie Kato, Musashino, and Yoshihiro Yoshida, Itabashi, all of Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,066
Claims priority, application Japan, Jul. 16, 1984, 59-147341; May 9, 1985, 60-96682
Int. Cl.[4] F16D *25/02, 25/063;* B60K *41/28, 41/02*
U.S. Cl. 192—85 AA **9 Claims**



1. A hydraulic type starting clutch comprising:

an input shaft;

an input rotating member arranged for rotation in unison with said input shaft;

an output shaft;

an output rotating member arranged for rotation in unison with said output shaft;

friction plates interposed between said input rotating member and said output rotating member for engagement therewith to transmit torque from said input rotating member to said output rotating member;

urging means interposed between said friction plates and said output rotating member for urging said friction plates to cause said transmission of torque from said input rotating member to said output rotating member;

a hydraulic pressure chamber defined between said urging means and said output rotating member and disposed to be supplied with a hydraulic fluid for acting upon said urging means to urge said friction plates;

a hydraulic fluid source for supplying said hydraulic fluid to said hydraulic pressure chamber;

pressure regulating valve means for regulating the pressure of said hydraulic fluid in said hydraulic pressure chamber; and

control means for controlling said pressure regulating valve means to regulate the pressure of said hydraulic fluid in said hydraulic pressure chamber so as to increase with an increase in the rotational speed of said input shaft, said control means comprising:

a governor housing secured to said input rotating member, and

actuating means operable in response to the rotational speed of said input shaft to actuate said pressure regulating valve means, said actuating means being arranged within said governor housing and directly engaging said pressure regulating valve means for urgingly displacing the same;

said urging means being responsive to the hydraulic fluid pressure increased by said control means to urge said friction plates to cause transmission of torque from said input rotating member to said output rotating member

when the rotational speed of said input shaft reaches a predetermined low speed value.

9. A hydraulic type starting clutch comprising:

an input shaft;

an input rotating member arranged for rotation in unison with said input shaft;

an output shaft;

an output rotating member arranged for rotation in unison with said output shaft;

friction plates interposed between said input rotating member and said output rotating member for engagement therewith to transmit torque from said input rotating member to said output rotating member, said friction plates including at least a first clutch plate and a second clutch plate,

said first clutch plate being mounted on said output rotating member in a manner circumferentially immovable and axially movable relative to said output rotating member;

urging means interposed between said friction plates and said output rotating member for urging said friction plates to cause said transmission of torque from said input rotating member to said output rotating member;

a hydraulic pressure chamber defined between said urging means and said output rotating member and disposed to be supplied with a hydraulic fluid for acting upon said urging means to urge said friction plates;

a hydraulic fluid source for supplying said hydraulic fluid to said hydraulic pressure chamber;

pressure regulating valve means for regulating the pressure of said hydraulic fluid in said hydraulic pressure chamber; and

control means for controlling said pressure regulating valve means to regulate the pressure of said hydraulic fluid in said hydraulic pressure chamber so as to increase with an increase in the rotational speed of said input shaft, said urging means being responsive to the hydraulic fluid pressure increased by said control means to urge said friction plates to cause transmission of torque from said input rotating member to said output rotating member when the rotational speed of said input shaft reaches a predetermined low speed value, said control means comprising:

a governor housing secured to said input rotating member, and

means operable in response to the rotational speed of said input shaft to actuate said pressure regulating valve means;

said second clutch plate being mounted on said governor housing at an outer periphery thereof in a manner circumferentially immovable and axially movable relative to said governor housing.

4,679,678

MINIMUM COMPLEXITY VIBRATION DAMPER

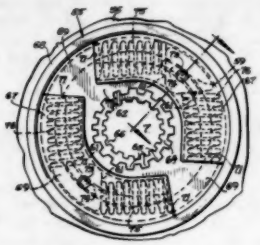
Paul A. Habel, Jr., and Elaine S. Kulczycki, both of Troy, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 564,151, Dec. 22, 1983, Pat. No. 4,555,009. This application Sep. 9, 1985, Ser. No. 773,691

Int. Cl.[4] F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **3 Claims**

1. A vibration damper assembly for a torque converter lock-up clutch, friction clutch or torsional coupling, comprising a pressure plate, a reactor plate, a generally cylindrical hub barrel operatively connected to a transmission input shaft, said reactor plate being directly connected to said hub barrel and having a pair of outwardly curved arcuate channels extending for approximately 180° acting as spring pockets and separated by a pair of diametrically opposed inwardly offset drive straps, said pressure plate being generally flat and provided wth a pair of diametrically opposed inwardly offset substantially triangular spring abutments 90° removed from said drive straps and projecting into said channels, and two pairs of oppositely disposed damper springs, said pressure plate and reactor plate forming the spring pockets enclosing said damper springs positioned between said spring abutments and drive straps, and



said drive straps and spring abutments providing reaction surfaces contacting the ends of the springs.

4,679,679

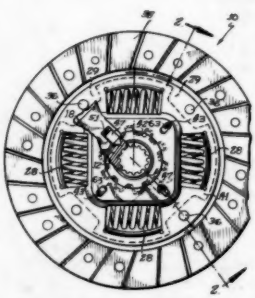
CLUTCH DRIVEN PLATE ASSEMBLY WITH ANTI-BACKLASH DAMPING

Thaddeus Lech, Jr., Sterling Heights, and Bruce A. Mullard, Mt. Clemens, both of Mich., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Jul. 11, 1985, Ser. No. 754,040

Int. Cl.[4] F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **9 Claims**



1. A clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, including a hub assembly having an inner hub with a barrel splined onto the input shaft and an outer hub having a radial flange, a clutch plate carrying friction facings at the outer periphery thereof, a spring retainer plate secured to the clutch plate to sandwich said outer hub flange therebetween, said plates and outer hub flange having axially aligned sets of circumferentially spaced windows therein, and damper springs received in each set of windows, the improvement comprising intermeshing backlash splines on said inner and outer hubs allowing limited relative rotation therebetween, means yieldable resisting relative rotation between said hubs including at least two radially-biased plungers in one hub and a plurality of camming recesses in said other hub corresponding to the number of plungers, so that rotation of said plates, damper springs and outer hub relative to said inner hub causes said plungers to cam out of said recesses, a first spacer located between said clutch plate and said inner hub and piloting said inner hub central to said outer hub, and anti-rotation tabs on the periphery of said spacer received in notches in said outer hub.

4,679,680

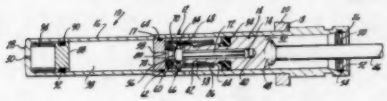
CLUTCH MASTER CYLINDER WITH INTERNAL RESERVOIR

Dennis J. Komatz, Birmingham, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation-in-part of Ser. No. 549,508, Nov. 7, 1983, abandoned. This application Jul. 23, 1984, Ser. No. 633,869

Int. Cl.[4] B60T *11/16;* **F16D** *65/32*

U.S. Cl. 192—85 R **4 Claims**



1. An actuating master cylinder for providing a hydraulic pressure signal in response to an operator input for actuating a hydraulic device through a hydraulic circuit, said master cylinder comprising an integral cylindrical housing having a first, open end and an opposing second, generally closed end, a first large diameter cylinder bore extending from said open end toward said closed end, a second smaller diameter cylinder bore extending from the inner termination of said first cylinder bore and terminating adjacent said closed end, said first and said second cylinder bores being coaxial and defining a shoulder at their junction, a reservoir plunger having a diameter complimentary to said second cylinder bore and inserted therein through said open end, biasing means interposed between said closed end and said reservoir plunger for urging said reservoir plunger toward said first cylinder bore, a plug having a diameter complimentary to said first cylinder bore and inserted through said open end and fixed in engagement with said shoulder, said plug, said reservoir plunger and said second cylinder bore defining a reservoir, an actuating plunger having a diameter complimentary to said first cylinder bore and slidably received therein through said open end for pressurizing fluid in said second cylinder bore, said actuating plunger and said plug defining with said first cylinder bore a working chamber, means for actuating said plunger in response to an operator input for pressurizing said working chamber, an outlet port in said housing communicating said first cylinder bore with the associated hydraulic circuit, passage means extending through said plunger for communicating said reservoir chamber with said working chamber and check valve means for controlling the flow through said passage means for precluding flow from said working chamber into said reservoir chamber when said actuating plunger is actuated by an operator for pressurizing said working chamber and for permitting fluid to flow from said reservoir into said working chamber when said actuating plunger has not been actuated by an operator.

4,679,681

SYNCHRONIZING RING AND PROCESS OF MANUFACTURING THE SAME

Martin Creydt, Wiesloch; Wolfgang Bickle, Reilingen, and Harald Pfestorf, Untereisesheim, all of Fed. Rep. of Germany, assignors to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

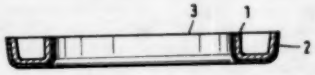
Filed Mar. 29, 1985, Ser. No. 717,633

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3412779

Int. Cl.[4] F16D *23/02, 13/66*

U.S. Cl. 192—107 M **2 Claims**

1. A synchronizing ring comprising a metal formed blank composed of a composite material, comprising a metallic layer consisting of an aluminum alloy of the type selected from the group of Al Si 12 Cu Ni Mg, Al Si 18 Cu Ni Mg and Al Zn 4.5 Si Pb Cu Mg and having a thickness of 0.1 to 1.0 mm forming



a friction cone and a steel backing layer having a thickness of 0.5 to 3.5 mm cladded to the metallic layer.

4,679,682

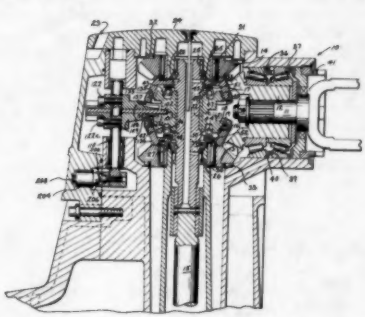
MARINE DRIVE SHIFT MECHANISM WITH DETENT CANISTER CENTERED NEUTRAL

Charles F. Gray, Jr.; Gary L. Meisenburg, both of Fond du Lac, and Alvin Zemlicka, Sheboygan, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 18, 1986, Ser. No. 897,627

Int. Cl.[4] F16D *21/04, 23/14;* **F16H** *3/14*

U.S. Cl. 192—21 **14 Claims**



1. In a marine drive having a housing with forward and reverse gear means and shift means having a forward position engaging said forward gear means and having a reverse position engaging said reverse gear means and having a neutral position disengaging said forward and reverse gear means, a detent canister assembly comprising a single modular unit mounted in said housing, said assembly comprising a cylindrical canister containing a ball and means biasing said ball into engagement with said shift means to center the latter in said neutral position.

4,679,683

CLUTCH COVER ASSEMBLY

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jul. 8, 1985, Ser. No. 752,425

Claims priority, application Japan, Jul. 9, 1984, 59-104268[U]

Int. Cl.[4] F16D *13/50*

U.S. Cl. 192—89 B **5 Claims**

1. A clutch cover assembly comprising a clutch cover body

and a diaphragm spring therein, said clutch cover body having an inner peripheral part, a plurality of diaphragm spring tabs on said clutch cover body at said inner peripheral part of said clutch cover body and having spaces therebetween in the circumferential direction of said inner peripheral part, said diaphragm spring tabs being bent inward of said clutch cover body and extending through tab openings in said diaphragm spring and extending radially outwardly at their inner end and a pair of wire rings disposed on said diaphragm spring tabs, one of said wire rings of said pair of wire rings being disposed on said diaphragm spring tabs between said clutch cover body and said diaphragm spring and the other of said wire rings of said pair of wire rings being disposed on the other side of said diaphragm spring between said diaphragm spring and said

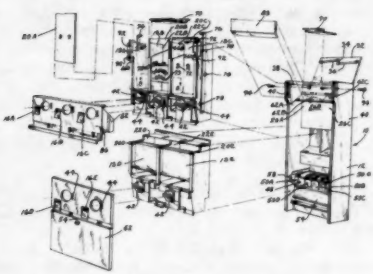
radially outwardly extending inner end of said diaphragm spring tabs, said diaphragm spring being between said wire rings, said diaphragm spring and said wire rings being supported by said diaphragm spring tabs; characterized by that pin opening are provided on the diaphragm spring adjacent the inner peripheral part of said clutch cover, said diaphragm spring tabs and said pair of wire rings, pins are fitted in said pin openings and extend through said diaphragm spring in such a manner that said diaphragm spring is slidable axially of said pins and without play in the circumferential direction of said diaphragm spring, and base portions of said pins are fixed to pin tabs at the inner peripheral part of said clutch cover body intermediate adjacent pairs of said diaphragm spring tabs and extending radially inwardly therebetween.

4,679,684

MULTIPLE CHAMBER AUTOMATED VENDING MACHINE

Robert L. Glaser, Deerfield, Ill., assignor to L. M. Becker & Co., Inc., Appleton, Wis.

Filed Mar. 3, 1986, Ser. No. 835,388
Int. Cl.[4] G07F *11/44*
U.S. Cl. 194—350 **2 Claims**



1. A multi-chamber automated vending machine comprising:

an outer housing;

an upper chamber and a lower chamber inside the housing, each of said chambers being adapted to hold a flowable body of merchandise items, each of said chambers having a filling port for introducing the merchandise items into the chamber and a dispensing port for dispensing the respective items to the outside of the chamber;

said upper chamber having a bottom wall and a plurality of vertically extending walls;

said lower chamber surrounding a portion of the bottom wall of the upper chamber and a portion of a vertically extending wall of the upper chamber;

automated vending means responsive to payment positioned in each of the chambers in the lower portion thereof which are separately operable;

door means connected to the housing providing an entry into the interior of the housing, whereby the filling ports for both chambers may be accessed by opening the door means;

wherein both of the chambers have associated therewith coin operated triggering means for controlling the vending of the merchandise in response to coin payment, each of said triggering means having a coin receptacle for receiving coins from outside the chamber and a coin pathway which directs coins to a coin storage area which is below both of the chambers; and

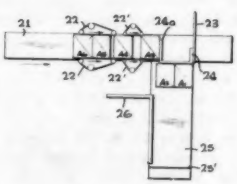
the coin pathway for the triggering means for the upper chamber communicates between the coin receptacle for the upper chamber and the storage area, and extends downward past at least the upper portion of said bottom chamber to the coin storage area.

4,679,685

ACCUMULATING COMMODITY CONVEYOR

Kenji Inoko, Shiga, Japan, assignor to AB Tetra Pak, Lund, Sweden

Filed Nov. 30, 1983, Ser. No. 556,647
Int. Cl.[4] B65G *47/31*
U.S. Cl. 198—461 **1 Claim**



1. A commodity conveying device incorporated into an accumulating device comprising:

a first conveyor forwarding commodities at a constant speed;

a second conveyor contiguous and perpendicular to said first conveyor, said second conveyor comprising a plurality of rotatable circular cylinders arranged in parallel to be connected at each end to one of a pair of identical endless chains;

a pusher in reciprocating motion which pushes said commodities off said first conveyor in a perpendicular direction onto said second conveyor; and

means for synchronizing the motions of said commodities, second conveyor, and said pusher so as to provide a constant flow rate of commodities whereby each commodity is separated from each other by a constant distance on said second conveyor, and for futher controlling the push off speed of said pusher to be equal to the speed of said second conveyor thereby avoiding any tumbling or damage to said commodities and eliminating problems during subsequent accumulation, said synchronizing means comprising sets of pairs of endless vertical belts disposed on either side

of said first conveyor with adjustable inter-belt distance and capable of gripping said commodities, with one of said belt pair set travelling at a speed lower than that of said first conveyor, and the other of said belt pair set travelling at a speed equal to that of said first conveyor, the combined effect providing desired constant commodity flow rate and constant distance of separation.

4,679,686

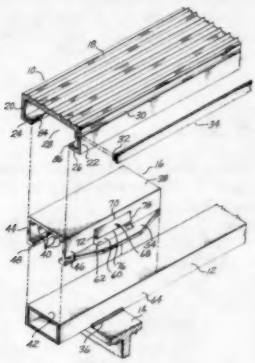
BEARING SYSTEM FOR RECIPROCATING FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation-in-part of Ser. No. 346,865, Feb. 8, 1982, Pat. No. 4,492,303. This application Dec. 10, 1984, Ser. No. 680,069

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—750 **7 Claims**



1. In a reciprocating floor conveyor of a type comprising a plurality of elongated floor members, each of which is a metal extrusion of channel form comprising a top panel, a pair of opposite side panels extending downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the side panels and defining a space between them, and each of which is supported on and guided by an elongated metal guide beam and a plurality of spaced apart plastic slide bearings on the guide beam, and further comprising drive means for moving the floor members in one direction along the guide beams and bearings, for advancing a load, and for retracting them in the opposite direction, an improved bearing system for the floor members characterized by:

each said plastic slide bearing having a top positioned above the guide beam, a side part on each side of the bearing depending from the top outwardly adjacent the sides of the guide beam, and a bottom lock flange projecting inwardly from each side part below the guide beam, and a wing on each side of the bearing, extending laterally outwardly from the bearing, said wings being in coplanar parallelism with each other and being spaced below and in parallelism with the top of the bearing, each said wing having an outer edge which makes mutually bracing contact with the outer edge of an adjacent wing on an adjacent plastic slide bearing, said bearing top being of a width smaller than the space between the two bottom flanges of the floor member, and each side part of each bearing including a sidewall which slopes downwardly and outwardly to a lower edge, said bearing having a width at the level of the lower edges of said sidewalls which is wider than the width of the space between the two bottom flanges of the floor member, each said sidewall lower edge being spaced above the upper surface of the wing on its side of the bearing, to define with the wing a space in which an inner edge portion of the bottom flange of the floor member on its side of the bearing is received, said sidewall being resiliently connected to the bearing such that the floor member can be set down on top of the bearing, with the top of the bearing positioned in the space between the two bottom flanges of the floor member, and the floor member can then be pushed downwardly, and the downward force applied by the flanges of the floor member on said sidewalls of the bearing will cause the sidewalls to spring inwardly to allow the floor member to move downwardly until the bottom flanges are in the slots defined between the bottom edges of the sidewalls and the top surfaces of the wings, at which time the sidewalls will spring outwardly into positions placing their lower edges above the bottom flanges of the floor member;

wherein said downwardly and outwardly sloping sidewalls are located generally at the longitudinal center of the bearing, and each is in the nature of a flap which is connected at its top to the bearing and has free ends and a free lower edge, each said sidewall functioning like a cantilever beam and bending at its edge of connection to the bearing in response to the downward force exerted on it by the flange of the floor member.

4,679,687

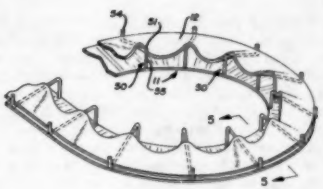
APPARATUS TO EFFECT STRESS-FREE TRANSPORTATION OF A RIBBON ON A CONVEYOR CAPABLE OF NEGOTIATING TURNS

Roger P. Rehm, Orrville, Ohio, assignor to Singer Products Corporation, Smithville, Ohio

Filed Oct. 2, 1985, Ser. No. 782,874

Int. Cl.[4] B65G *21/18*

U.S. Cl. 198—778 **8 Claims**



1. A conveyor system having a plurality of transverse belt members with inner and outer ends, picket means secured to the inner and outer ends of said belt members, said picket means being nestable and telescopic with the picket means on successive belt members and inter-engaging successive belt members to permit said belt members to move effectively along a straightaway as well as through right- or left-hand turns, support members to permit a flat ribbon of material to negotiate turns without deleteriously deforming the ribbon being presented from said belt members at selected longitudinal intervals along said conveyor system, said support members being inclined upwardly relative to the belt members each support member being inclined upwardly from an outer edge of the turn towards an inner edge of the turn.

4,679,688

PACKAGE FOR RISK SAMPLES

Jan Söderholm, Luntmakargatan 71, 1 tr, Stockholm, Sweden S-113 51, and Hugo Cedraeus, Grönviksvägen 187, Bromma, Sweden S-161 42

Continuation of Ser. No. 734,274, filed as PCT/SE 84/00295, Sep. 12, 1984, published as WO 85/01272, Mar. 25, 1985, abanonded.

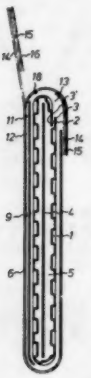
This application Sep. 10, 1986, Ser. No. 906,616

Int. Cl.[4] B65D *81/26*

U.S. Cl. 206—204 **10 Claims**

1. A package useful for shipment of risk samples (8) con-

tained in a primary package (7), including a first casing (1) and a second casing (6) containing the first casing, and characterized in that the first casing (1) is formed with translucent shock absorbent material and defines an internal compartment (5) for receiving a sample (8), said second casing is at least partly translucent and defines together with said first casing a compartment (9) intermediate the respective casings for insertion of a document therein, said first casing and said second casing are arranged such that said internal compartment is visually checkable by viewing through translucent portions of the respective casings, means are provided for preventing reading of the inserted document from outside said second casing, said



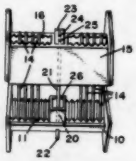
first casing has a pair of edges (3,3') defining a slit-shaped opening (2) to said internal compartment, said second casing has a slit-shaped opening (13) in communication with the opening of said first casing and with said intermediate compartment, and said second casing further has an adhesive cover flap (14) with a removable protective tape (15), said cover flap being foldable over both the slit-shaped opening of said first casing and the slit-shaped opening of said second casing in such a manner that, with said protective tape removed, said cover flap adhesively seals to said edges (3,3') and effects a liquid and gas-tight seal of said edges, thereby sealing the slit-shaped opening of said first casing, and adhesively seals to said second casing to seal the slit-shaped opening of said second casing.

4,679,689

PROCESSING, SHIPPING AND/OR STORAGE CONTAINER FOR PHOTOMASKS AND/OR WAFERS

Eugene R. Blome, San Jose, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 3, 1985, Ser. No. 771,871
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—334 **14 Claims**



1. A system for holding photomasks and/or wafers in a clean environment during processing, shipment and/or storage of said photomasks and/or wafers said system comprises:

a first processing tray having grooves in which a lower portion of the edges of said photomasks and/or wafers are inserted, said first tray has an opening along its bottom surface permitting the escape of chemicals that are used in the processing of said photomasks and/or wafers;

a second processing tray having grooves, said second tray positioned above said first tray so that the grooves of said second tray will hold a upper portion of the edges of said photomasks and/or wafers, said second tray has an opening along its top surface so that said second tray may be used to permit the escape of chemicals that are used in the processing of said photomasks and/or wafers;

means for connecting said first tray to said second tray, so that said photomasks and/or wafers will be held firmly in place; and

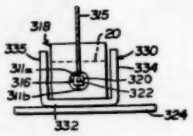
a container which contains one or more inflatable diaphragms connected to the inside surface of said container, in which said first and second trays and said means are inserted, whereby when said container is closed, said one or more diaphragms inflate causing said wafers and/or photomasks to be securely held within said first and second trays.

4,679,690

FASTENER ORIENTING, TAPPING AND COLLECTION SYSTEM

John H. Steward, Bloomfield Hills, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 395,410, Jul. 6, 1982, Pat. No. 4,476,599, which is a division of Ser. No. 151,549, May 20, 1980, Pat. No. 4,338,694. This application Oct. 15, 1984, Ser. No. 660,774
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—345 **4 Claims**



1. A Stack of nuts removeably retained in serial alignment for delivery to a nut installation means, each nut having a body portion with generally polygonal top and bottom faces, and a central threaded bore extending through each nut body portion and through said top and bottom faces, and generally perpendicular thereto, the stack of nuts comprising in combination:

a plurality of said nuts in the form of a stack with the top face engaging the bottom face of the next adjacent nut, and said nut bores in general co-axial alignment; and

a removeable flexible linear connector wire loop extending through said generally co-axially aligned nut bores having a bight portion and a pair of return portions substantially parallel to the axis of said aligned nut bores, said connector loop releasably interconnecting said nuts in stacked relation for delivery to said nut installation means without fixedly retaining any two adjacent nuts.

4,679,691

THREE-SIDED TIP TRAY

Kevin J. Halloran, 25200 Carlos Bee Blvd., Button Bash Plaza, SE. 380, Hayward, Calif. 94542

Filed Aug. 12, 1985, Ser. No. 764,728
Int. Cl.[4] B65D *1/34*
U.S. Cl. 206—557 **5 Claims**

1. A tip tray comprising:

a rectangular, planar, transparent plate having a top and

bottom surface, first and second lateral end edges, and first and second longitudinal side edges;

narrow upturned walls formed on the top surface of said plate and along only three edges thereof;

a pair of narrow, elongated, substantially parallel support bars formed on the bottom surface of said plate and along the first and second longitudinal side edges thereof, each of said support bar extending along at least a portion of the first lateral end edge of said plate to form a stop member;

at least two tabs formed along the sides of each of said support bars, said tabs extending laterally inward from said support bars, the top surface of said tabs being spaced from the bottom surface of said transparent plate to form a thin holding track between said bottom surface and said tabs for removably securing cardstock visible through said transparent plate.

4,679,692

CONTAINERS FOR COSMETICS

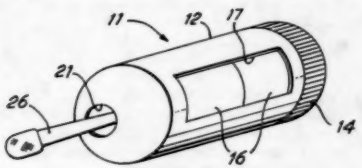
Brian Davey, North Shields, England, assignor to Lion Brush Works Limited, Newcastle-upon-Tyne, England

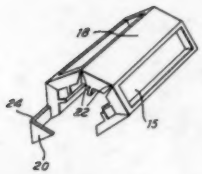
Filed Jan. 18, 1985, Ser. No. 692,587

Claims priority, application United Kingdom, Jan. 20, 1984, 8401504

Int. Cl.[4] A45D *40/24*

U.S. Cl. 206—581 **7 Claims**





1. A cosmetic container comprising:

support means having a plurality of mutually inclined surfaces, said support means comprising a plurality of trays, and hinge means connecting each tray to an adjacent one of said trays, said trays being folded about said hinge means so that each tray forms one of said mutually-inclined surfaces;

a plurality of cosmetics, a respective one of said cosmetics being located in each of said trays; and

a housing having a substantially cylindrical sidewall disposed in surrounding relationship to said support means and being rotatable relative thereto, said support means when disposed in said housing being oriented such that the trays project radially outwardly toward the sleevelike sidewall of the housing relative to the cylindrical axis thereof, said cylindrical sidewall having an elongated aperture formed through the cylindrical sidewall thereof for providing access to at least one of the trays when the latter is radially aligned with the aperture.

2. A cosmetic container comprising:

a housing having a cylindrical wall;

an elongate aperture in said cylindrical wall of said housing, said aperture having its major dimension extending generally parallel to the axis of the cylindrical wall;

support means mounted within said housing, said support means being generally cylindrical and being mounted for rotation about the cylindrical axis of the housing;

a plurality of cosmetics carried by said support means, said cosmetics being disposed around said axis and disposed on said support means so as to face radially outwardly of said axis;

knob means connected to said support means and projecting from said housing so that rotation of said knob about said axis causes rotation of said support means within said housing to present a different one or group of said cosmetics, in turn, at said elongate aperture; and

said housing having a generally flat end wall, a second aperture in said flat end wall, said second aperture being radially offset relative to said axis, said support means including at least one recess, at least one cosmetic applicator accommodated in said recess, and said support means being rotatable to bring said recess into alignment with said second aperture whereby said applicator can be removed from said recess.

4,679,693

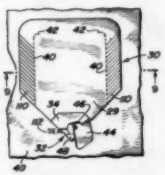
LABEL RESEALING CONTAINER

Harold Forman, P.O. Box 363, Conshohocken, Pa. 19428

Filed May 14, 1986, Ser. No. 863,073

Int. Cl.[4] B65D *81/24*

U.S. Cl. 206—610 **5 Claims**



1. A resealable container comprising:

(a) a container with at least one face capable of being torn, said tearable face including a preformed, generally U-shaped slit, said slit forming a tongue flap in said tearable face;

(b) a releasable label having one dry side and one adhesive side, said adhesive side coated with releasable, pressure sensitive adhesive and including an uncoated section at one label end to form a pull tab, said label adhesive side facing and adhering to said container's tearable face so that said label completely surrounds and overfits said container's U-shaped slit; and,

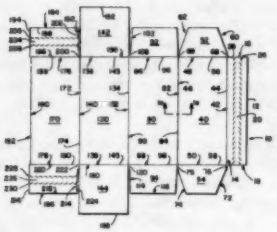
(c) a pull tab extension adjoining said pull tab with perforations defining said pull tab edge, said extension having generally two dry sides but with one area on one side of said extension including permanent adhesive to hold said tab and extension to said container until opening so that when said extension is pulled, it releases said tab to allow opening of said container and leaves said adhesive extension area fastened to said container as evidence of unsealing.

4,679,694

CARTON AND BLANK FOR PACKAGING ICE CREAM OR THE LIKE

Paul J. Donohie, Pittsford; Gary L. Gray, Fairport, and Frank G. Capuano, Rochester, all of N.Y., assignors to Rendoll Paper Company, Rochester, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,293
Int. Cl.[4] B65D 5/54
U.S. Cl. 206—611 16 Claims



1. A carton for packaging ice cream or the like, comprising:
(a) connected cover, front, bottom and rear panels,
(b) said panels being substantially rectangular in shape,
(c) each of said panels having left, right, top and bottom edges,
(d) said cover panel having a closure flap hingedly connected to said cover panel at said cover panels top edge,
(e) said rear panel hingedly connected at its top edge to said bottom edge of said cover panel,
(f) said bottom panel hingedly connected at its top edge to said bottom edge of said rear panel,
(g) said front panel hingedly connected at its top edge to said bottom edge of said bottom panel,
(h) each of said panels having a left end flap hingedly connected to said left edge and a right end flap hingedly connected to said right edge,
(i) said end flaps each having inner, outer, upper and lower edges,
(j) said left and right rear panel end flaps extending from said left and right edges of said rear panel a distance sufficient to overlap said corresponding left and right front panel end flaps,
(k) the length of said inner edges of said left and right bottom panel end flaps being substantially equal to the length of said left and right edges of said bottom panel respectively,
(l) said closure flap having at least one weakness line running substantially parallel to said cover panel's top edge,
(m) said left and right front panel end flaps comprising a first pair of end flaps and said left and right rear panel end flaps comprising a second pair of end flaps and one of said pair of flaps having a weakness line formed in each flap of said pair,
(n) means for securing said closure flap to said front panel, and
(o) means for securing said left and right front panel end flaps to said left and right rear panel end flaps respectively.

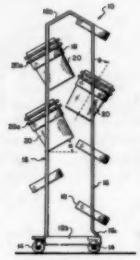
4,679,695

CONTAINER RACK

Thomas E. Leff, 10302 Viacha Dr., San Diego, Calif. 92124

Filed Sep. 17, 1984, Ser. No. 650,729
Int. Cl.[4] A47G 29/00
U.S. Cl. 211—71 8 Claims

1. An apparatus for supporting a plurality of containers comprising:
a horizontal rectangular open frame base defined by a pair of parallel side beams connected together at the ends thereof by means of a pair of parallel end beams;
a plurality of vertically extending support members secured to and extending upward at least from the ends of the side beams of the base and defined by a pair of spaced apart elongated legs connected at the lower end thereof to the base and connected together at top thereof by a cross member extending generally parallel to the end beams;
holding means defined by encircling open frame means connected in horizontal rows between the legs of adjacent support members above and at each side of the base and encircling the outer wall of cylindrical containers and



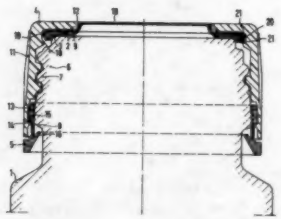
removably holding a plurality of cylindrical containers in vertically spaced rows extending horizontally parallel to the side beams of the base, and the holding means and, hence, the containers of each row being disposed above and at least partially within the dimensions of said base and inclined from their normal freestanding position away from the containers in an adjacent row, wherein the rows of holding means on opposite sides are offset vertically and the containers at least partially overlap at the center of the base.

4,679,696

CONTAINER AND SEALING ASSEMBLY

Yvon Bonnenfant, Vittel; Philippe Odet, St. Georges; Raymond Perne, Anse, all of France, and Claude Thevenot, D.Om Joao, Portugal, assignors to Societe Generale des Eaux Minerales de Vittel, Vittel and Astra Plastique, St. Georges de Reneins, both of, France

Filed Apr. 26, 1985, Ser. No. 727,534
Claims priority, application France, Apr. 26, 1984, 84 06765
Int. Cl.[4] B65D 41/04
U.S. Cl. 215—252 17 Claims



1. A disposable container having an opening and a sealing assembly having means for indicating that the container has not been opened, said sealing assembly comprising:
a sealing member having a disc for enclosing the opening of said container and a seal positioned between said disc and said opening; and
a collar having means for engaging the opening of said container, for retaining said sealing member to the opening of said container;
wherein said disc has a central projection which is con-

nected to the remainder of said disc by a sloping surface, and wherein said collar has a recess for receiving the central projection of said disc and a chamfer for receiving the sloping surface of said disc.

4,679,697

BOTTLE TOP

Eugene J. Allaire, 310-225 East 13th, North Vancouver, British Columbia, Canada V7L 2L6

Filed Feb. 18, 1986, Ser. No. 799,894
Int. Cl.[4] B65D *41/42*
U.S. Cl. 215—295 **8 Claims**

1. A bottle cap comprising a generally flat portion with a skirt extending downwardly from the flat portion and adapted to be crimped onto a bottle;

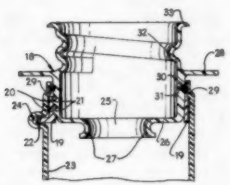
a plurality of depressions arranged on the interior of the flat portion of the cap, extending about one third through the thickness of the cap and providing lines of weakness in the cap to facilitate bending, and thus release, of the cap when the cap is installed on a bottle.

4,679,698

FUEL TANK FILLER TUBE RESTRICTOR ASSEMBLY

John E. Thorn, Sylvania, Ohio, and William W. Burns, Iowa City, Iowa, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 335,015
Int. Cl.[4] B65B *3/00*
U.S. Cl. 220—86 R **30 Claims**



1. A restrictor assembly for the end of a filler tube, which comprises:

A. a flexible band adapted to be inserted into the end of the filler tube to form a locking ring lying against the inside surface of the filler tube and having a V-shaped gap between the ends of the locking ring more narrow in a direction axially inward said filler tube, the inner surface of the flexible band comprising first engagement means;

B. a wedge adapted to be inserted into said V-shaped gap to expand the locking ring against the inside surface of the filler tube; and

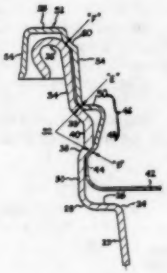
C. a restrictor cup comprising a tubular side wall and a restrictor wall with an opening through it, adapted to be inserted, restrictor wall first, into the filler tube to engage said locking ring, which restrictor cup comprises second engagement means adapted to engage said first engagement means.

4,679,699

SEALING LID AND CONTAINER

Charles R. Malsbury, Palmer, and Richard R. Lawrence, Wilbraham, both of Mass., assignors to Rexcel, Inc., Ludlow, Mass.

Filed May 22, 1986, Ser. No. 865,860
Int. Cl.[4] B65D *39/00*
U.S. Cl. 220—307 **36 Claims**



1. A sealing lid for use with a cup, formed of an enclosure member having an outwardly extending rim defining an opening and a first sealing means disposed below said opening and extending inwardly of said rim, comprising when said lid is snapped onto the cup over the rim:

a. a panel member having a periphery;

b. an outer wall member secured to said panel member along its periphery, said outer wall member having a second sealing means disposed for cooperative sealing engagement with said first sealing means of said cup so as to provide a first sealing of said cup;

c. an annular hollow rib secured to said outer wall member and extending over said cup rim, said rib having a third sealing means disposed for cooperative sealing engagement with said cup rim so as to provide a second sealing of said cup; and

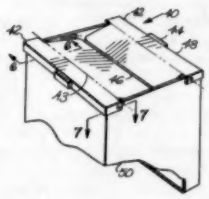
d. said panel member, outer wall member and rib being configured and dimensioned for snap-fitting sealing engagement with said cup over said opening.

4,679,700

SELF-CLOSING CONTAINER TOP

G. Robert Tharrington, 3901 Sawyer Wood Rd., Sarasota, Fla. 33583, and Isabella A. Hodge, 2931 Coral Shores Dr., Ft. Lauderdale, Fla. 33306

Filed Oct. 10, 1986, Ser. No. 917,708
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—337 **8 Claims**



1. A self-closing container top adapted to be supportively received over a container having an upper rim defining an opening, said container top comprising:

two generally horizontal top panels each supportively disposed for rotation about opposing coaxial mounting shafts having a generally horizontal axis;

each said top panel having a center margin and an outer margin;

said top panels in opposing side-by-side arrangement one to another forming a common parting line between one said center margin to another;

each said axis disposed from said center margin but not to said outer margin;

stop means for preventing each said top panel from rotating about said axis beyond a position wherein said center margins become upwardly divergent;

counterweight means disposed on each said top panel between each said axis and said outer margin for self-righting said top panels to a closed position wherein each said top panel is against said stop means and generally horizontal;

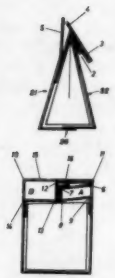
said container top substantially covering the container opening when said top panels are in said closed position.

4,679,701

RESEALABLE PACK

Horst W. Ackermann, Orbe; Petr Masek, Yverdon, and Jean Servaux, Savigny, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Jun. 17, 1985, Ser. No. 745,590
Claims priority, application Switzerland, Jul. 5, 1984, 3248/84
Int. Cl.[4] B65D *43/24, 90/04*
U.S. Cl. 220—404 **6 Claims**



1. A resealable pack comprising:

a gusseted bag, having an open end at its top, within a relatively rigid outer envelope in the form of a box having a bottom and at least two sets of opposing sidewalls having bottom edges affixed to the box bottom;

a first movable part having a top edge, two side edges and a bottom edge, and an inner and an outer face surface, the bottom edge being affixed to a top edge of a first of said sidewalls of the box;

a second movable part having a top edge, two side edges and a bottom edge, and an inner and an outer face surface, the bottom edge being affixed to a top edge of a second of said sidewalls of the box which opposes the first sidewall;

a first and a second moveable member each having two outer faces and two edges, one edge of the first and second movable members being affixed to the first and second movable parts, respectively, the other edge of the first and second movable members being affixed to the first and second sidewalls, respectively, such that when each movable member is in a closed position, the outer faces, sidewall and movable part define a deformable parallelogram, one face of each movable member being bonded to an outer face of the open end of the gusseted bag at a distance below the top of the bag, the faces of each movable member being of a length such that said one face of each closes and seals the bag when in a closed position; and

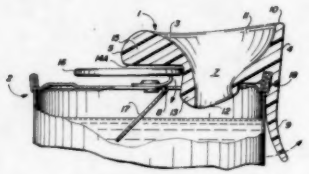
a movable flap having a top edge and a bottom edge, the bottom edge being affixed to and extending from the top edge of the first movable part, the flap being of a length such that when in a closed position and folded over it extends to the bottom edge of the second movable part.

4,679,702

SANITARY DRINKING ACCESSORY FOR A METAL BEVERAGE CAN

Anthony J. Maccarone, Glendale, Ariz., and Stephen M. Orr, San Luis Obispo, Calif., assignors to By Macaroni, Inc., Glendale, Ariz.

Filed Oct. 6, 1986, Ser. No. 915,426
Int. Cl.[4] A47G *19/22;* **B65D** *25/48, 39/00*
U.S. Cl. 220—90.2 **3 Claims**



1. A sanitary drinking accessory adapted to be detachably coupled to the top of a metal beverage can of the type which is provided with an integral manually-operable feature for effecting an opening in the can lid in order that the beverage may be consumed directly from the can, the can being further characterized by a can lid which has been fixed to the can body in such a manner that the junction between the can lid and the can body includes a circumferential raised edge and terminates in a circumferential, downwardly facing shoulder extending about the can body proximate its top edge, said drinking accessory comprising:

(A) a unitary body fabricated from a resilient plastic material which is not inherently potentially toxic when brought into contact with a human mouth; and

(B) said unitary body having:

1. a top surface;
2. a bottom surface;
3. an intermediate zone between said top surface and said bottom surface and defining the thickness of said unitary body at each position across said top surface and said bottom surface;
4. a periphery, said periphery including:
   a. a rear section, and
   b. a front section, said front section having:
      i. a top;
      ii. a bottom; and
      iii. a shape, in horizontal cross section, in the form of a circular section generally conforming to the curve of the circumference of the top of the beverage can with which said drinking accessory is to be used;
5. an aperture extending completely through said intermediate zone, said aperture having an upper section and a lower section:
   a. said aperture flaring outwardly at its upper section such that its side walls merge with and comrise at least a portion of said top surface;
6. a drinking lip defined by contiguous portions of said top surface and said top of said front section of said periphery,
7. integral attachment means for detachably fixing said unitary body to a beverage can, of which the manually-operable feature has been actuated to obtain an opening in the can lid, such that:
   a. said front section of said periphery encompasses at least a portion of the circumference of the can top
   b. said rear section of said periphery extends beyond the opening in the can lid; and

c. said lower section of said aperture is aligned with the opening in the can lid; and

8. said integral attachment means further comprising:

1. a recess disposed between said bottom surface and said front section of said periphery, said recess being dimensioned and configured to snugly receive the can raised edge when said drinking accessory has been operably affixed to a can; and

2. a tab depending downwardly from said front section of said periphery;

whereby, when said drinking accessory has been attached to the beverage can, a consumer may drink the can contents from said drinking lip without touching the can directly with his mouth and removal of said drinking accessory from the can may be facilitated by manually pulling the tab outwardly away from the can body to thereby increase the clearance between said recess and the can raised edge such that said drinking accessory may be peeled away from the can.

4,679,703

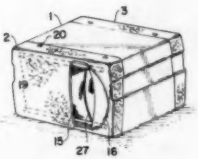
DEVICE FOR PREVENTING NAPKINS FROM BUNCHING AT THE DISPENSING OPENING IN A PAPER NAPKIN DISPENSER

Raymond F. De Luca, Samford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Mar. 2, 1984, Ser. No. 585,538

Int. Cl.[4] A47K *10/24;* **B65H** *1/00*

U.S. Cl. 221—52 **13 Claims**



1. In a napkin dispenser having at least one face plate with a generally elongated dispensing opening and pressure exerting means for urging a napkin stack with two opposed edges and a further edge perpendicular to said two opposed edges toward said face plate, said further edge disposed adjacent said dispensing opening, a device for substantially preventing napkins from bunching at said dispensing opening when napkins are successively withdrawn from said dispenser, said device comprising pressure relief means mounted adjacent said face plate to engage said napkin stack only along a substantial length of said two opposed edges thereof for reducing the level of pressure exerted by said face plate on the center portion of said napkin stack, wherein said presure relief means is positioned with respect to said face plate, said napkin stack and said discharge opening such that when further edge of a napkin is pulled from said discharge opening the edges of the napkin which form said two opposed edges of said napkin stack are progressively stripped from said pressure relief means simultaneously.

4,679,704

GRAVITY PIPE TRANSPORT SYSTEM

Raymond B. Dunlop, 411 Chitek Crescent, Saskatoon, Saskatchewan, Canada S7K 5C1, and William E. G. Taylor, 810 Gordon Street, Moosomin, Saskatchewan, Canada (S0G 3N0)

Filed Oct. 28, 1985, Ser. No. 792,030

Claims priority, application Canada, Oct. 31, 1984, 466689

Int. Cl.[4] B65G *11/20, 53/66*

U.S. Cl. 222—56 **13 Claims**

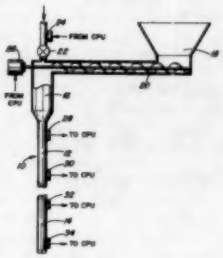
1. A gravity flow pipe transport system for material comprising non-slurried solids particles, said system comprising:

a pipe of which at least a major portion is generally upright, said pipe having an upper section and a lower section;

controllable supply means to supply said material to the upper section of said pipe;

controllable air flow means to provide a flow of naturally aspirated air into said pipe;

monitoring means to provide signals indicative of the pressures and the location of flow regimes and a flow regime interface therebetween at a plurality of locations along the length of said pipe;



control means responsive to the signals provided by said monitoring means to vary the rate at which said material is supplied to said pipe and the rate of air flow into said pipe whereby plugging of said pipe by said materials is substantially eliminated.

4,679,705

FLUID SUPPLY SYSTEM, A CONNECTOR AND A VALVE

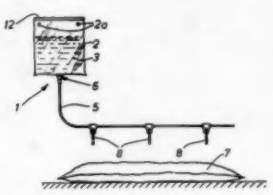
Malcolm F. Hamilton, Southminster, England, assignor to Hozelock-ASL Ltd., Buchinghamshire, England

Filed Aug. 3, 1982, Ser. No. 404,790

Claims priority, application United Kingdom, Jan. 14, 1982, 8201041

Int. Cl.[4] B67B *7/26*

U.S. Cl. 222—90 **17 Claims**



4. A two-part progressive flow valve for a fluid supply system, said valve comprising:

(a) a first part snap-engageable into a second part and being relatively rotatable therein between first and second angular positions,

(b) in said first angular position said valve is closed and in said second angular position said valve is fully open,

(c) said second part having a circular seating portion corresponding in diameter to a first circular portion of said first part so that in use said first portion is seated in said seating portion and rotatable about the axis of said seating portion,

(d) each of said first and second parts including a further circular portion and these further portions being arranged eccentrically to one another,

(e) said further portion of said first part including a bore extending generally radially thereof,

(f) the bore is blocked off by said further portion of said

second part in said first angular position with said two further portions in engagement with a gap remote from a region surrounding said bore between said further portions, and

(g) in said second angular position, said bore is not blocked off and said valve is fully open and there is a gap near the region surrounding said bore between said further portions.

16. A connector suitable for connecting two regions together separated by a wall or partition, said connector comprising:

(a) at least a first piece and a second piece releasably snap-lockable together with said wall or partition gripped therebetween and with said connector surrounding a hole in said wall or partition,

(b) said first piece being provided with a male portion, which in use passes through said hole in said wall and is snap-locked in the female portion of said second piece,

(c) said second piece being generally tubular,

(d) said female portion comprising a bore having a first portion flared in a direction towards said first piece when said first and second pieces are releasably locked together and in locking said female portion said flared first portion of said bore is engaged by a head of said male portion which resiliently deforms said second piece and/or is itself resiliently deformed until head snap engages a locking abutment on said female portion, at which location an annular gap is defined between said female portion and said male portion between the head and the remainder of said first piece,

(e) said first piece being separable from said second piece first by closing the gap to thereby move said locking abutment in relation to said head so that said head and male portion may then be retracted from said female portion.

4,679,706

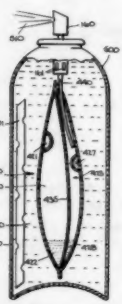
DISPENSING SYSTEM WITH INFLATABLE BAG PROPELLING MECHANISM AND SEPARATE PRODUCT GAS PHASE

David J. Magid, Doylestown; Barbara Svitila, Wayne, and William Kalriess, Quakertown, all of Pa., assignors to Enviro-Spray Systems, Inc., Hoboken, N.J.

Filed Oct. 29, 1984, Ser. No. 666,202

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—130 **8 Claims**



1. An apparatus for developing an internal pressure within a dispensing system adapted to dispense a flowable product and for introducing a gas into the product to be dispensed which comprises:

an inflatable bag with at least two chambers being substantially impervious to the flowable product to be dispensed which includes a pressurizing gas phase chamber and an integral product gas phase chamber separate and isolated therefrom, said pressurizing gas phase chamber including therein gas generating components which upon admixing generate gas and increase the number of moles of gas present in said pressurizing gas phase, said gas pressurizing phase chamber walls being non-gas permable, said product gas phase chamber including therein gas generating components which upon admixing generate gas and increase the number of moles present in said product gas phase, and

means for transferring said product gas phase from said separate compartment into the flowable product to be dispensed from the dispensing system.

4,679,707

POST-MIX BEVERAGE DISPENSER APPARATUS HAVING FRONT ACCESS FOR LOADING SYRUP, CO_2 AND WATER

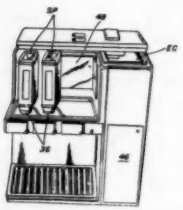
Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 634,044, Jul. 24, 1984, Pat. No. 4,497,348, which is a continuation of Ser. No. 320,476, Nov. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 277,806, Jun. 26, 1981, Pat. No. 4,357,284. This application Feb. 4, 1985, Ser. No. 697,899

The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—129.1 **8 Claims**



1. A self-contained, portable post-mix, carbonated beverage dispenser apparatus for use on a counter top comprising:

(a) a cabinet having front, side, back, top and bottom walls and a base for supporting the cabinet on a counter top;

(b) a self-contained refrigeration means disposed within said cabinet;

(c) a carbonator including a carbonator tank for holding a supply of water to be carbonated;

(d) a manually refillable water reservoir, separate from, but coupled in fluid communication with said carbonator tank, said reservoir being disposed within the cabinet in a substantially non-removable manner for supplying water to said carbonator tank, said water reservoir having an upwardly facing entrance opening means contiguous to said front and side walls and accessible through said top wall for receiving a manually introduced water supply so that water can be manually poured into said reservoir without removing said reservoir from said cabinet and without repositioning said cabinet on said counter top;

(e) at least one replaceable flavor concentrate container disposed contiguous to said front wall;

(f) at least one replaceable CO_2 cylinder disposed contiguous to said front wall for supplying CO_2 gas to said carbonator tank;

(g) access means for the water entrance opening means, flavor concentrate container, and CO_2 cylinder, permitting water, flavor concentrate containers and CO_2 cylinders to be introduced into said cabinet at positions contiguous to the front wall thereof; and

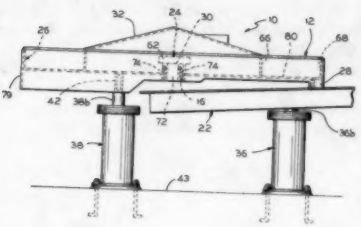
(h) a dispensing station at said front wall for delivering a post-mix, carbonated beverage formed from a mixture of flavor concentrate and carbonated water.

4,679,708

UNIFORM MATERIAL DISCHARGE APPARATUS

James F. Spence, Elgin, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Jan. 15, 1986, Ser. No. 818,973
Int. Cl.[4] B67D 5/64
U.S. Cl. 222—161 10 Claims



1. A material discharge apparatus, comprising:

a hopper having a material supporting surface and defining an opening;

means for vibrating said hopper to move material in a substantially horizonal flow path along said supporting surface toward said opening;

means for discharging material through said opening at a preselected uniform rate, said means for discharging material limiting material discharge to no more than said preselected uniform rate independent of the rate at which material actually reaches said opening,

said discharging means having recirculating means with an upwardly facing surface situated over said opening and an edge which intercepts material moving in said horizontal flow path; and

means are provided for changing the vertical location of said edge,

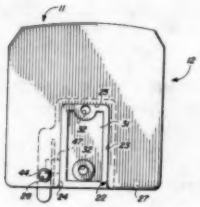
whereby material moving in said hopper in said flow path below said edge flows into the opening and material moving in said hopper in said flow path above said edge is directed by the surface on the recirculating means over the opening and back into the horizontal flow path.

4,679,709

DISPENSER MOUNTING SYSTEM

James W. Poitras, Holliston, and Edwin W. Wlodyka, Ashland, both of Mass., assignors to Highland Laboratories, Ashland, Mass.

Filed Jun. 12, 1985, Ser. No. 743,941
Int. Cl.[4] B67D 5/06
U.S. Cl. 222—180 19 Claims



1. A liquid dispenser comprising:

container means comprising a bowl for retaining a liquid to be dispensed and a mounting plate portion demountably retaining said bowl and having a downwardly, forwardly and rearwardly opening slot defined by a slot edge means, a front surface bounding said slot, and a rear surface adapted to be justaposed to a support surface; and

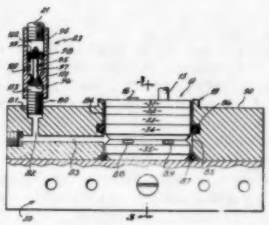
bracket means comprising a body portion with a back surface for engaging the support surface and defining openings for fasteners for securing said bracket means to the support surface, wall means extending transversely to the support surface, and skirt means projecting from said wall means and spaced from and substantially parallel to the support surface; said wall means engaging said slot edge means so as to provide vertical support for said plate portion, and said skirt means and the support surface engaging said front surface and said rear surface, respectively, so as to provide horizontal support for said plate portion, and wherein said openings are justaposed to and accessible via said slot.

4,679,710

HOT MELT FOAM ADHESIVE SYSTEM

Calvin R. Jameson, and Dario J. Ramazzotti, both of Atlanta, Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Jun. 22, 1981, Ser. No. 276,044
Int. Cl.[4] F01C 1/14; F04C 15/04
U.S. Cl. 222—190 8 Claims



1. Apparatus for dispensing a foamed adhesive or sealant material, said apparatus comprising,

a pump,

means for supplying said material in a liquid state to said pump;

a source of gas,

means for supplying gas from said source to said pump such that said pump is operable to agitate said liquid material in the presence of the gas so as to distribute said gas throughout said liquid material and to pressurize said liquid material and gas to place said gas into solution with the liquid material, and

means for dispensing said liquid material and gas solution at a pressure below the solution maintenance pressure of said gas and liquid material solution whereby the gas is released from solution as said liquid forms a form,

said means for supplying gas to the pump including a check valve for preventing the back flow of liquid material from said pump to the source of said gas, and said check valve being located above the horizontal plane of said pump such that liquid material cannot flow by gravity from said pump into said check valve.

4,679,711

MULTI-ORIFICE ZERO CAVITY NOZZLE DISPENSER

Larry C. Trevathan, Westlake, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 11, 1985, Ser. No. 774,656
Int. Cl.[4] B67D 5/34
U.S. Cl. 222—330 6 Claims

1. A device for dispensing multiple closely spaced streams of liquid comprising

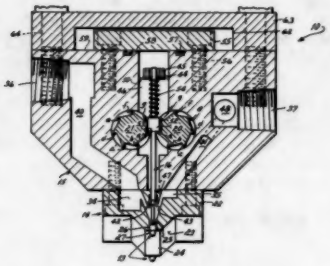
a nozzle having a plurality of parallel axial bores therein, each of said axial bores having a valve seat located therein,

each of said axial bores terminating in an outlet orifice located downstream of said valve seat,

a plurality of axially movable valve needles, one of said axially movable valve needles being located within each of said bores,

each of said valve needles having a valve section formed thereon, said valve section of each of said valve needles being engageable with the valve seat of the bore within which said valve needle is located,

a cam surface on each of said valve needles,



oscillatable actuator means engageable with said cam surface of each of said valve needles to control opening and closing movement of said valve needles relative to said valve seats of the bores within which said valve needles are located,

adjusting means for selectively adjusting the number and location of said axially movable needle valves simultaneously engaged and actuated by said actuator means, said adjusting means comprising a rotatable cam, and

said actuator means comprising a motor for effecting oscillation of said rotatable cam.

4,679,712

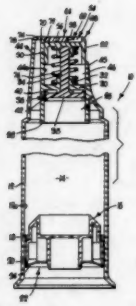
ORIFICE COVER SLIDE ACTUATOR LOCK FOR VISCOUS PRODUCT DISPENSER

Donald D. Foster, and David G. Moore, both of Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Feb. 25, 1985, Ser. No. 705,240

Int. Cl.[4] B67D *5/40*

U.S. Cl. 222—384 **5 Claims**



1. In a dispensing pump having a discharge spout and a depressible actuator adjacent the spout for operating the pump, the improvement comprising:

a locking cover shiftably carried by said actuator for movement relative to the latter between an open position opening the spout and a closed position closing the spout,

said cover being disposed when in said open position to clear the spout for unimpeded depression of the actuator and when in said closed position to overlie the spout and lock the actuator against depression,

said actuator being provided with means adjacent the upper extremity thereof defining a transverse guide track with respect to the path of travel of the actuator during depression thereof, said cover being slidably received in said track for movement between said open and closed positions thereof,

the pump including a tubular body having a primary product chamber and a secondary pumping chamber for communication with the primary chamber,

said spout being disposed for communication with the primary chamber, and said secondary chamber having a reciprocable pumping piston therein coupled with the actuator for movement therewith during depression of the actuator.

4,679,713

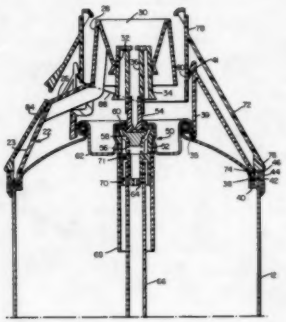
VALVE ACTUATOR

James R. Crapser, and Edward J. Malek, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 18, 1985, Ser. No. 724,390

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—402.13 **14 Claims**



1. A valve actuator for use with an aerosol container and comprising:

a cap mountable on the discharge end of the container and having a movable operating member adapted to shift a valve member carried by the container from normal valve closed position to open position to allow discharge of the container contents; and

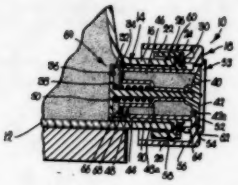
actuator means supported exterior of said cap for movement relative thereto and having a surface for engaging and operating said operating member as said actuator means is moved from a first to a second position,

wherein said surface on said actuator means is inclined relative to a surface of said operating member to cam the same into valve opening position when said actuator means is moved from said first position to said second position and to release said operating member when said actuator means is moved from said second position to said first position,

whereby said operating member can be manually shifted into said valve opening position when said actuator means is in said first position and

whereby said operating member remains in said valve opening position so long as said actuator means is in said second position.

4,679,714
UNIT DOSE LIQUID DISPENSER
William S. Blake, Linwood, N.J., assignor to Realex Corporation, Kansas City, Mo.
Filed Nov. 13, 1984, Ser. No. 670,313
Int. Cl.[4] G01F 11/38
U.S. Cl. 222—449 1 Claim



1. A metering device for use in dispensing successive, equal-size doses of liquid product from the neck of a container on which the device is mounted, said device comprising:

a first body adapted to be immovably received within the neck of the container;

a second body telescopically coupled with said first body for alternate disposition in a filling position and an axially shifted discharge position,

said bodies cooperating to define a dosage accumulation chamber fillable during disposition of the second body in said filling position and dischargeable during placement of the second body in said discharge position,

said bodies having an inlet valve at a normally inner end thereof adapted to open when said second body is in said filling position and close when the second body is in said discharge position,

said bodies further having an outlet valve at a normally outer end thereof adapted to open when said second body is in said discharge position and close when the second body is in said filling position,

said second body having an externally disposed, manually actuatable skirt spaced radially outwardly from said chamber for manipulation by a user in moving the second body between said filling and discharge positions thereof; and

means for yieldably biasing said second body toward one of said positions thereof,

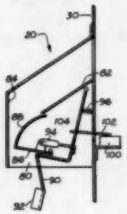
said outlet valve including an annular seat on one of said bodies and a stopper on the other of said bodies having an annular surface sealingly engaging said seat when the second body is in said filling position and axially spaced from said seat when the second body is in said discharging position,

said stopper being on said first body and said seat being on the second body,

said first body being provided with a normally inner end having a centrally disposed stem projecting axially therefrom in the direction of said outlet valve, said stopper being carried by said stem at a termination thereof remote from said inner end of the first body,

said second body being provided with a normally inner end having a centrally disposed sleeve projecting axially therefrom in reciprocable, surrounding relationship to said stem, said stem having a coil spring encircling the same within said sleeve and trapped between a shoulder on said sleeve and means on said first body for yieldably biasing the second body toward said filling position.

4,679,715
ICE CUBE DISPENSING OUTLET
Donald G. Hovinga, Mason City, Iowa, assignor to Schneider Metal Manufacturing Co., Mason City, Iowa
Filed Sep. 6, 1985, Ser. No. 773,479
Int. Cl.[4] B67D 3/00, 5/62
U.S. Cl. 222—517 5 Claims



1. An ice cube dispensing apparatus comprising:

(a) a dispensing chute having a pair of opposed side walls, a floor, a front panel, and an outlet defined between the floor and front panel;

(b) a segment shaped outlet door having an outer surface which normally closes the outlet, said door being pivotally mounted to the side walls at a radial centerpoint of the door;

(c) a manual door opener having a pivotal mounting to the dispensing apparatus and a cup receptive abutment thereon below the door enabling the door opener to be pushed in a first direction away from the front panel and pivotally about the pivotal mounting;

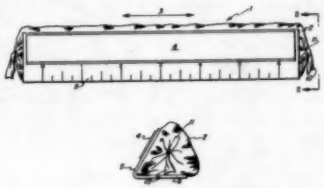
(d) means connnecting the door opener to the door for opening the door when the abutment is pushed in said first direction;

(e) a spring biasing the door opener in a second direction opposite to said first direction and the door to its closed position;

(f) an ice cube dispensing switch means for operating a motor in the dispensing apparatus; and

(g) means on the door for operating the switch means when the door is open.

4,679,716
NEEDLE ORGNIZER
Marilyn Layton, 2320 SW. 46th Ter., Fort Lauderdale, Fla. 33317
Continuation of Ser. No. 617,661, Jun. 4, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 792,179
Int. Cl.[4] A41H 31/00
U.S. Cl. 223—109 R 7 Claims



1. An organizer for selective use of a plurality of needles threaded with floss or threads of different colors comprising:

(a) frame means acutely angular in cross section and fixed in a rigid position, thereby providing an angular space, said frame means being formed by first and second planar sections, said planar sections connected together along one edge to form said acute angle, said first planar section being an organizer supporting segment which lies in a horizontal position upon a support surface, said second planar section being a means for displaying indicia, said

means for displaying readily visible to a user when said organizer is placed upon a support surface;

(b) an elongate solid pin cushion of substantially uniform cross section throughout substantially its entire length, constructed of a material capable of manually receiving needles in the external surface thereof,

said cushion being confined within said acutely angular frame in the rear of said organizer, said cushion being generally hidden from sight of a user behind said second planar section when said organizer is placed upon a support surface.

4,679,717

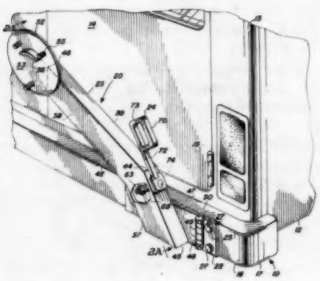
SPARE TIRE CARRIER

Dale G. Hansen, HC Box 14B, Star Valley, Ariz. 85541

Filed Mar. 16, 1984, Ser. No. 590,470

Int. Cl.[4] B62D *43/00*

U.S. Cl. 224—42.06 **7 Claims**



1. A spare tire carrier for use in combination with a vehicle, which vehicle includes

an upright body panel, and

a frame member extending along said body panel and having a face surface,

and for detachably supporting a spare tire, which spare tire includes

a central hub opening, and

a plurality of attachment openings spaced about said hub opening,

and for supporting said tire for movement about an upright axis with the stress therefrom borne by said frame member, said spare tire carrier comprising:

a. a mounting bracket securable to said frame member;

b. a support arm having

i. a first end hingedly coupled to said mounting bracket for rotation of said support arm about an upright axis, and

ii. a free end having attachment means for detachable securement of said spare tire;

c. latch means for selectively retaining said support arm in a normal position in which said spare tire is substantially parallel with said body panel, said latch means comprising

i. a latch plate carried by said frame member and having an opening therein; and

ii. a bolt carried by said support arm and receivable within the opening of said latch plate when said spare tire is in said normal position;

d. biasing means normally urging said bolt in a first direction to penetrate the opening within said latch plate;

e. release means for selectively moving said bolt in a second direction to withdraw said bolt from the opening within said latch plate, said release means comprising

i. a lever having a fixed end coupled with said bolt and a free end defining a handle, and

ii. a fulcrum carried by said support arm intermediate the ends of said lever, said lever being rotatable about said fulcrum in response to pressure applied to said handle for moving said bolt in said second direction.

4,679,718

CUTTER FOR DISPENSING CONTAINER AND DISPENSING CONTAINER PROVIDED WITH SAID CUTTER

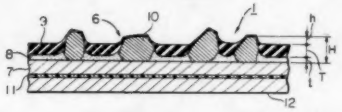
Hisao Kai, Chiba; Kensuke Ochiai, Tokyo, and Takeshi Niisato, Saitama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1986, Ser. No. 843,471

Claims priority, application Japan, Mar. 25, 1985, 60-58279; Mar. 25, 1985, 60-58280

Int. Cl.[4] B65D *85/672*

U.S. Cl. 225—48 **16 Claims**



1. A cutter for dispensing container, characterized by having a file-like coarse surface formed on the surface of a foldable substrate by fast adhesion of irregular granules to the surface of said substrate with a soft adhesive agent covering said irregular granules, said soft adhesive agent having an elongation of 130 to 700%, as measured in accordance with ASTM D-882.

4,679,719

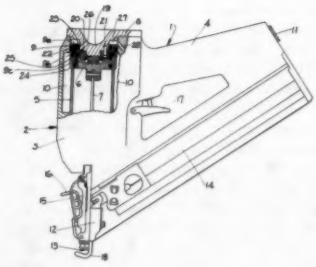
ELECTRONIC CONTROL FOR A PNEUMATIC FASTENER DRIVING TOOL

Francis J. Kramer, Edgewood, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Dec. 27, 1985, Ser. No. 814,189

Int. Cl.[4] B25C *1/06*

U.S. Cl. 227—5 **36 Claims**



1. A pneumatic fastener driving tool and an electronic control system therefor, said tool comprising a body containing a cylinder and a piston, a driver mounted on said piston, a firing valve above and normally closing the upper end of said cylinder, a reservoir connected to a source of air under pressure, a volume above said firing valve, said volume being connectable to said reservoir such that air under pressure from said reservoir maintains said firing valve closed, said volume being connectable to exhaust to open said firing valve and permit air under pressure to enter said cylinder above said piston and to cycle said tool, said volume normally being connected to said reservoir, a manual trigger, a workpiece responsive trip, a

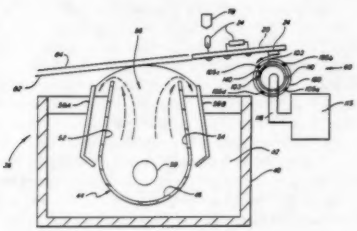
magazine and a plurality of fasteners within said magazine, said electronic control system comprising a solenoid actuated valve and a solenoid therefor, said solenoid actuated valve being ported to connect said volume above said firing valve to exhaust when said solenoid is actuated, control circuit means having an output connected to said solenoid to actuate said solenoid, said control circuit having inputs at least from said manual trigger and said workpiece responsive trip, said control circuit means being operative to determine the mode of operation of said tool, to interpret said inputs and to generate an output to said solenoid when said inputs satisfy said mode of operation.

4,679,720

MASS SOLDERING SYSTEM PROVIDING A SWEEPING FLUID BLAST

A. Victor Sedrick, Jr., Goffstown, N.H., and Charles R. Lowell, Concord, Mass., assignors to Hollis Automation, Inc., Nashua, N.H.

Filed Oct. 23, 1986, Ser. No. 922,184
Int. Cl.[4] H05K *3/34*
U.S. Cl. 228—20 **14 Claims**



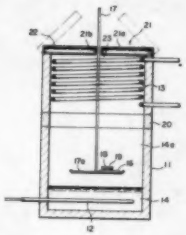
1. An apparatus for mass joining with solder electrical and electronic components assembled on a circuit board wherein said components have leads which protrude therefrom, and comprising in combination: a wave soldering station adapted to provide a wave of molten solder; means for transporting said circuit board across said solder whereby a quantity of molten solder may be deposited onto said circuit board underside and said protruding leads; and an excess solder removal station adjacent said wave soldering station, said excess solder removal station adapted to impinge a sweeping fluid blast of continuously varying angle of impingement directed towards the solder wave onto the bottom surface of the board sufficiently soon after it leaves the solder wave so that the solder is still molten, the sweeping fluid blast having sufficient velocity to remove essentially all bridges and shorts but not sufficient velocity to adversely affect properly wetted joints, whereby each portion of the bottom surface of the board may be subjected to a sweeping fluid blast from a plurality of different angles, said excess solder removal station comprising a first fixedly positioned inner tubular shell having at least one inlet and having an open slot directed toward the point where said boards exit said wave, and a second rotatably mounted outer tubular shell having a plurality of elongate spaced slots formed therein, means for rotating said outer tubular shell and fluid supply means for connection to said inlet, said outer tubular shell encompassing and rotating about said inner tubular shell such that fluid emanating from said inner tubular shell will be directed by the open portion of the inner tubular shell through the slot of the outer shell to form a sweeping fluid blast.

4,679,721

APPARATUS FOR FUSE-BONDING ARTICLES

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1986, Ser. No. 908,025
Claims priority, application Japan, Sep. 17, 1985, 60-203343; Sep. 17, 1985, 60-203344
Int. Cl.[4] B23K *1/08*
U.S. Cl. 228—40 **8 Claims**



1. An apparatus for bonding first and second articles maintained in a predetermined relative position with a fusible bonding agent provided therebetween, comprising:

a closed vessel for containing a heat transfer liquid such that a space is defined above the liquid level of said heat transfer liquid, said heat transfer liquid having a boiling point higher than the melting point of said bonding agent;

heating means provided in said vessel for heating said heat transfer liquid within said vessel to a temperature higher than the boiling point of said heat transfer liquid so that vapors of said heat transfer liquid fill said space in said vessel;

a cooler provided in an upper portion of said space for condensing vapors of said heat transfer liquid;

entrance and exit port means provided in said vessel for communication with said space and designed to permit the passage of said first and second articles together therethrough;

means for conveying said first and second articles along a predetermined path through said space via said entrance and exit port means; and

closure means provided adjacent to said entrance and exit port means and moveable for opening and closing said entrance and exit port means, said closure means being provided with cooling means therein for condensing the vapors of said heat transfer liquid.

4,679,722

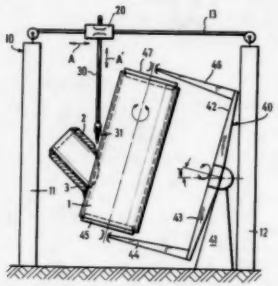
METHOD AND APPARATUS FOR WELDING TWO PIPES ALONG THEIR LINE OF PENETRATION

Werner Flindt, Geesthacht, and Hans Noll, Leverkusen, both of Fed. Rep. of Germany, assignors to Klöckner Wilhelmsburger GmbH, Geesthacht, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,633
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444820
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—168 **3 Claims**

1. A method of welding a secondary pipe to a primary pipe using a vertically-downwardly extending electric welding burner, the secondary pipe being welded to the primary pipe at an attachment point located between opposite ends of the primary pipe and such that the secondary pipe will extend at an angle α relative to an imaginary central axis which extends through the primary pipe, the method comprising the steps of (1) cutting an attachment end of said secondary pipe such that the contour thereof generally conforms to the contour of the outer surface of said primary pipe along a line of penetration of said secondary pipe in the outer surface of said primary pipe at

said attachment point, (2) beveling the attachment end of said secondary pipe so that when the attachment end of said secondary pipe is positioned against the outer surface of said primary pipe at said attachment point, a continuous welding space will be provided therebetween, (3) positioning said secondary pipe relative to said primary pipe such that the attachment end of said secondary pipe abuts the outer surface of said primary pipe at said attachment point, (4) positioning both said primary pipe and said secondary pipe such that the downwardly-extending electric welding burner will be aimed at the weld-



ing space therebetween, (5) initiating operation of said welding burner, and (6) rotating said primary pipe about its imaginary axis, rotating said primary pipe end over end and moving said primary pipe about a horizontal axis spaced therefrom, while simultaneously moving said welding burner vertically upwardly and downwardly and horizontally, so that said welding burner will continuously aim into said weld space as said primary pipe is rotated and will operate at a constant current strength, thus providing a continuous and optimum weld in said weld space.

4,679,723

METHOD OF SOLDERING THE OUTER SLEEVE OF A COAXIAL CABLE CONNECTOR TO A HOUSING

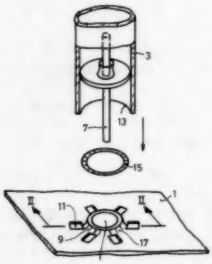
Ernst-Ludwig Veit, Solms, and Jürgen Klee, Braunfels, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 828,117, Feb. 10, 1986, abandoned. This application Oct. 22, 1986, Ser. No. 922,823

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505616

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—168 **9 Claims**



1. A method of soldering a metallic sleeve to a metal plate, around an opening in the plate, comprising

forming a raised wall portion around the opening in the plate, so as to form a raised edge of the opening,

placing a ring of wire solder around said wall portion,

placing a sleeve, having a mounting surface at an end of the sleeve, with said mounting surface abutting the plate, such that the sleeve surrounds said ring of solder and the solder is disposed in a trough defined by the sleeve, the plate, and the raised wall portion, and then

melting said solder by heating it, and then permitting it to cool and solidify, thereby soldering said sleeve to said plate.

4,679,724

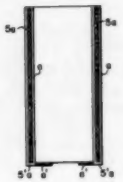
WATER-PROOF CONTAINER

Hiromichi Inagaki, 1-143, Aza Maedaomote Inuyama-shi, Aichi, Japan

Division of Ser. No. 745,875, Jun. 18, 1985, which is a division of Ser. No. 543,319, Oct. 19, 1983, Pat. No. 4,551,123. This application Oct. 4, 1985, Ser. No. 784,517

Int. Cl.[4] B65D *90/04*

U.S. Cl. 229—4.5 **7 Claims**



1. A container comprising: a paper base member; a double-wall heat shrinkable plastic film covering the paper base member and having at least one portion heat sealed to close the paper base member entirely within the plastic film; and a lid connected to the base member for closing at least one open end of a container shape formed by the paper base member; the container being made by a method comprising: covering the paper base member with said heat-shrinkable plastic film having a pair of walls with a space therebetween, the paper base member being positioned between the walls and in the space; removing all air from the space between the walls to pull the walls of plastic film against the paper base member; sealing said at least one portion of the plastic film to close the space in an air tight manner after removing air from the space; forming the base member into the container shape having at least one open end; and covering the at least one open end with said lid to close the at least one open end of the container shape.

4,679,725

END CLOSURE LOCK

Jerry F. Wilson, West Monroe, La., assignor to Manville Sales Corporation, Denver, Colo.

Continuation of Ser. No. 577,108, Feb. 6, 1984, abandoned. This application Mar. 13, 1986, Ser. No. 846,826

Int. Cl.[4] B65D *75/52*

U.S. Cl. 229—40 **4 Claims**

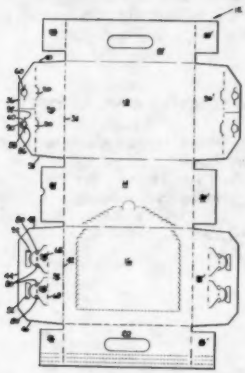
1. A wrap-around sleeve style carrier comprising:

a bottom panel, two side panels, and a top panel;

two pairs of end panels hingedly joined to opposite ends of said side panels along fold lines to close the ends of said carrier,

each pair of end panels comprising a first end panel and a second end panel, said first end panel having a primary locking means comprising two spaced apart locking tabs and a secondary locking means comprising two spaced apart locking openings, said first end panel further having slits extending outwardly from opposite sides of each locking opening at the widest part thereof, the slits extending in the general direction of said fold lines, said second end panel having a primary locking means comprising two spaced apart locking openings adapted to receive said primary locking tabs and a secondary locking means comprising two spaced apart punch locking tabs, each of said punch locking tabs having a head portion adapted to be punched through one of said secondary locking openings

and a tapered body portion hingedly joined at a base to said second end panel along a fold line and connected to said head portion through a neck portion, the width of the neck portion being less than the width of a secondary locking opening at the widest part thereof and the width of the head portion being less than the combined width of a secondary locking opening at the widest part thereof and the lengths of the slits extending therefrom, said tapered body portion having edges converging from adjacent the base of said tapered body portion to said neck portion, said head portion having edges extending outwardly from said neck portion which are adapted to engage the inside of the first end panel adjacent said secondary openings to prevent said punch tabs from pulling out of said secondary



openings, and said second end panel having two relief tabs on either side of each of said neck portions to facilitate the insertion of said punch tabs into said secondary openings, said relief tabs extending between said converging edges of said body portion and said edges of said head portion, said relief tabs being hingedly joined to said second end panel along fold lines extending from said converging edges of said body portion toward said edges of said head portion, and

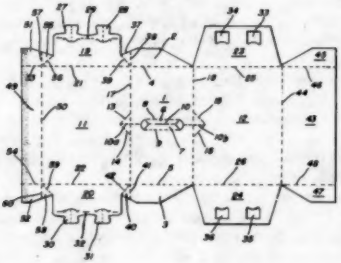
said first end panel at least partially overlapping said second end panel with said primary locking tabs engaged in said primary openings and said secondary male punch tabs extending over said first end panel and engaged in said secondary openings to lock the end panels together.

4,679,726

END CLOSURE STRUCTURE FOR AN END LOADING CARTON

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 17, 1986, Ser. No. 820,524
Int. Cl.[4] B65D *5/08*
U.S. Cl. 229—138 **8 Claims**



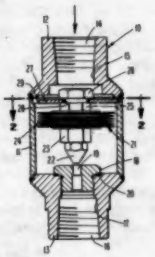
1. End closure means for an end loading carton having foldably joined top bottom and side walls forming a tubular structure, said closure means comprising a pair of closure flaps foldably joined to an end edge of said bottom and said top walls respectively, a pair of closure panels foldably joined to corresponding end edges of said side walls respectively, foldable web structure foldably joined to a side edge of each of said closure flaps and to the adjacent side edge of one of said closure panels to form interconnections therebetween, the other of said closure panels being folded inwardly to its end closing position and said one of said closure panels being folded outwardly so as to impart a closing force inwardly to said closure flaps through said webs to move said closure flaps toward closed positions overlapping said other closure panel following which said one closure panel is closed into overlying relation with said web structures and into overlapping relation with said closure flaps and said other closure panel, and adjoining means securing said closure panels and said closure flaps together.

4,679,727

THERMOSTATIC STEAM TRAP WITH SELF-CENTERING VALVE

Thomas Alesson, Plains, Pa., assignor to Nicholson Division, Datron Systems, Inc., Wilkes-Barre, Pa.

Filed Aug. 13, 1986, Ser. No. 896,054
Int. Cl.[4] F16T *1/10*
U.S. Cl. 236—56 **2 Claims**



1. A thermostatic steam trap comprising a hollow body having an inlet opening, an outlet opening, a valve seat formed in the outlet opening, a valve adapted to seal the outlet opening in cooperation with the valve seat, thermostatic actuating means adapted to move the valve into and out of sealing contact with the valve seat, and a baffle contained within the hollow body and adapted to intercept the flow of steam entering the inlet opening and to prevent said steam flow from taking a direct course between inlet and outlet openings, characterized by a cylindrical portion forming part of said hollow body, said cylindrical portion and remaining portions of said hollow body being so configured as to support a baffle in the form of a solid circular plate transversely of the cylindrical portion proximate to said inlet opening and so as to permit slight transverse and axial movement of said plate, said plate having formed therein a central opening so configured as to engage and retain said thermostatic actuating means in a position permitting said actuating means to axially move towards and away from said outlet opening, and also permitting said actuating means slight transverse and axial movement with respect to said plate, said thermostatic actuating means having said valve rigidly attached thereto, whereby upon operation of said actuating means to effect sealing contact of the valve with the valve seat, the valve is concentrically aligned with the valve seat by the relative motion between the hollow body, circular plate and thermostatic actuating means, said circular plate having additionally formed upon its peripheral edge a plurality of nonarcuate segments, thereby forming spaces between said segments and the adjacent inner surface of the

cylindrical portion, whereby steam entering said inlet portion is diverted from directly impinging upon said thermostatic actuating means and indirectly passed to said outlet opening.

4,679,728

ELECTRICAL CONTROL UNIT

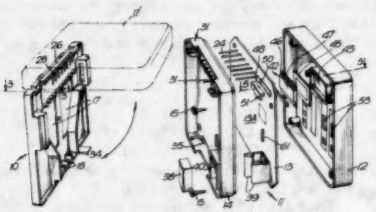
Mark Gregory, Coventry, England, assignor to Potterton International Limited, London, England

Filed Aug. 24, 1983, Ser. No. 525,990

Claims priority, application United Kingdom, Aug. 31, 1982, 8224857

Int. Cl.⁴ H01H *9/26*; H05K *1/14*

U.S. Cl. 237—1 R **14 Claims**



1. An electrical control unit comprising a backplate for mounting on a surface such as a wall, and a housing for electrically operated control circuits, the backplate having means for terminating external electrical connections at a plurality of positions, the housing being removably secured on the backplate and having means for electrically connecting the control circuits with at least some of the terminations on the backplate upon mounting the housing on the backplate, and the terminations on the backplate having a cover and means for selectively moving said cover member when said housing is removed from said backplate between positions in which, in a first position, even with the housing mounted on the backplate, the terminations are accessible externally of the unit, and in a second, operative position the terminations are covered by said cover plate and inaccessible externally of the assembled backplate housing.

4,679,729

APPARATUS AND METHOD FOR REGULATING FLOW AND TEMPERATURE IN A CENTRAL HEATING INSTALLATION

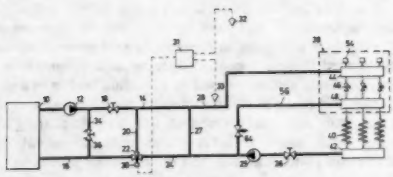
Robert Petitjean, Limal, Belgium, and Bo G. Eriksson, Borås, Sweden, assignors to Tour & Andersson AB, Johanneshov, Sweden

Filed Apr. 18, 1986, Ser. No. 853,470

Claims priority, application Sweden, Apr. 29, 1985, 8502062-6

Int. Cl.⁴ F24D *3/00*

U.S. Cl. 237—8 R **10 Claims**



1. A method of regulating the flow and the temperature in a central heating installation, including a feed water pipe (**14**, **28**) from a heat source (**10**), a heating circuit comprising a control and distributing unit (**38**) having an inlet chamber (**44**) connected to the feed pipe and provided with a plurality of outlets, a plurality of heating coils (**40**, **40′**, **40″**) issuing from said inlet chamber by way of said outlets, a collecting unit (**42**) for said coils, a return water pipe (**24**, **16**) for returning water from the coils to the heat source (**10**), water circulating means (**12**, **25**), water transfer means (**27**) for transferring part of the return water flow to the inlet side of the heating coils (**40**, **40′**, **40″**), flow volume in the separate coils being limited by means of valves (**54**, **54′**, **54″**, **62**, **62′**, **62″**), the improvement being that a portion of the return water is returned to a mixing chamber (**48**) positioned between the inlet chamber and the coils and the feed water flow for each individual coil (**40**, **40′**, **40″**) from each of said outlets (**52**, **52′**, **52″**) passes through said mixing chamber (**48**) where a portion of the return water mixes with the feed water for each individual coil, thus separately adjusting the inlet temperature for each individual coil (**40**, **40′**, **40″**) and maintaining at least an approximately constant flow through each coil.

4,679,730

HEATER FOR WARMING AN OPERATOR OF A VEHICLE

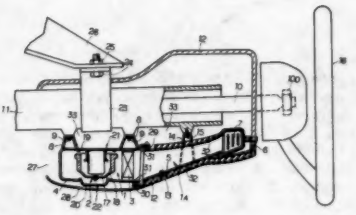
Goroh Uchida, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 31, 1985, Ser. No. 697,023

Claims priority, application Japan, Apr. 10, 1984, 59-71427

Int. Cl.⁴ B60H *1/02*

U.S. Cl. 237—12.3 R **17 Claims**



1. A heating apparatus for warming an operator of a vehicle comprising:

a steering wheel;

a steering shaft connected to said steering wheel and rotating with angular displacements of the steering wheel;

a steering column supported by a vehicle body and substantially enclosing the steering shaft therein;

a steering column cover enclosing the steering shaft and a portion of the steering column therein, an interval being defined between the steering column and the steering column cover, the steering column cover including at least one opening;

a casing mounted on the steering column and located within said interval without contacting the steering column cover, and including an inlet and an outlet, a space being defined between said casing and said steering column cover;

a blowing means located within said casing;

a heating means located within said casing such that said blowing means and said heating means are enclosed by the casing as one unit, said unit being easily attached to the steering column, while transmitting no vibration or heat to the steering column cover; and

a duct having an inlet, an outlet and an intermediate portion, said duct being located within said interval, said inlet of said duct being in communication with said outlet of said casing, said outlet of said duct being in communication with said at least one opening of said steering column cover, said intermediate portion of said duct being cov-

ered by insulation material, whereby vibration and heat are not transmitted to the steering column cover.

4,679,731

RAILWAY TRACK STRUCTURE AND A METHOD OF BUILDING SUCH STRUCTURE AND BAGS FILLED WITH BALLAST MATERIAL

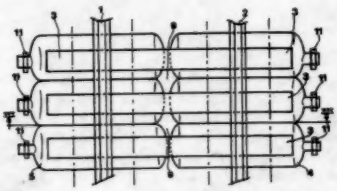
Karl Klugar, Graz, Austria, and Gerardus P. T. M. Van Santvoort, Elst, Netherlands, assignors to Akzo nv, Arnhem, Netherlands

Continuation of Ser. No. 539,383, Oct. 6, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 824,921

Claims priority, application Netherlands, Oct. 6, 1982, 8203871

Int. Cl.[4] E01B *1/00*

U.S. Cl. 238—2 **22 Claims**



1. A railway track structure formed of at least a pair of rails which are fastened to a plurality of mutually separated sleepers extending in transverse direction of the rails, which are via the sleepers supported on a bed of ballast material, characterized in that each sleeper is supported by and fastened to at least one supporting element comprising a closed bag at least substantially filled with hard ballast material such as pebbles, broken stone and/or sand, which bags mainly form the load-bearing portion of said bed of ballast material.

4,679,732

VECTORABLE EXHAUST NOZZLE FOR A GAS TURBINE ENGINE

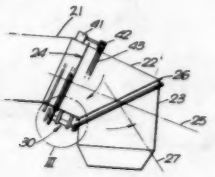
Clifford S. Woodward, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Jul. 31, 1985, Ser. No. 760,767

Claims priority, application United Kingdom, Aug. 16, 1984, 8420799

Int. Cl.[4] B64C *15/00*

U.S. Cl. 239—265.35 **8 Claims**



1. A vectorable exhaust nozzle for a gas turbine engine comprising:

a first duct;

a rotatable second duct having an upstream end substantially parallel with a downstream end of the first duct;

a first bearing means for attaching the downstream end of the first duct to the upstream end of the second duct to allow the second duct to be rotatable about a longitudinal axis perpendicular to the plane of the first bearing means, the second duct terminating at a downstream end in a plane which lies at an acute angle α to the longitudinal axis;

a rotatable third duct having an upstream end substantially parallel with the downstream end of the second duct and terminating in an orifice from which an exhaust gas stream issues;

a second bearing means for attaching the downstream end of the second duct to the upstream end of the third duct to allow the third duct to be rotated about an axis perpendicular to the plane of the second bearing means;

actuating means for rotating the second duct;

and epicyclic transmission means mounted on and rotatable with the second duct comprising: a first input member operable to drive the epicyclic gear train when the second duct is rotated, a first co-operating means, including a member fixed to the first duct, adapted to drive the first input member, an output member operable to be driven by the epicyclic gear train, a second co-operating means including a member fixed to the third duct adapted to be driven by the output member and thereby rotate the third duct in an opposite direction to rotation of the second duct and simultaneously therewith, and a third co-operating means operable on a second input member adapted to also drive the epicyclic gear train and thereby vary the velocity ratio between the first input member and the output member as a function of an angle θ through which the second duct is rotated by the actuating means.

4,679,733

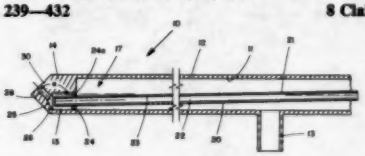
TWO-FLUID NOZZLE FOR ATOMIZING A LIQUID-SOLID SLURRY

Charles W. Lipp, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1986, Ser. No. 839,254

Int. Cl.[4] B05B *7/00, 7/14*

U.S. Cl. 239—432 **8 Claims**



1. A two-fluid mixing nozzle which comprises:

(a) an elongated first conduit for the flow of a gas through said nozzle, said gas being introduced into the distal end or portion of said first conduit and discharged from the proximate end of said first conduit into a dispersion chamber, said first conduit including a reduced portion, said reduced portion (1) having a cross-sectional area for flow which is less than the cross-sectional area for flow provided by that portion of said first conduit which is adjacent said reduced portion, (2) having a longitudinal axis which is angularly offset from the longitudinal axis of at least a portion of the remainder of said first conduit, and (3) terminating at its downstream end at said dispersion chamber;

(b) an elongated second conduit which has a portion thereof located within and substantially coaxial with the longitudinal axis of said reduced portion of said first conduit, said second conduit being for the flow, cocurrently with the flow of said gas, of a liquid-solid slurry through said nozzle, said liquid-solid slurry being introduced into the distal end or portion of said second conduit and being discharged from the proximate end of said second conduit, said liquid-solid slurry discharge being into said dispersion chamber; and

(c) a third conduit in fluid communication with said dispersion chamber through which the dispersion formed in said dispersion chamber is discharged from said nozzle, said

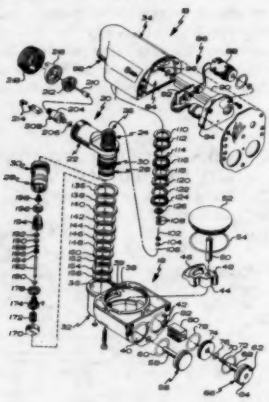
third conduit being in oblique relationship with the longitudinal axis of said at least a portion of the remainder of said first conduit.

4,679,734

ROBOT SPRAY GUN

Gordon V. Mommsen, Brooklyn Center, Minn.; Norman N. Fender, Monroe, Mich.; Stanley G. Karwoski, St. Paul, Minn.; William C. Scherer, Minneapolis, Minn., and Robert J. Lind, Robbinsdale, Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Oct. 30, 1985, Ser. No. 792,907
Int. Cl.[4] B05B *5/02, 15/08*
U.S. Cl. 239—692 **5 Claims**



1. A spray gun for mounting on a robot, said spray gun comprising:

main housing comprising a fluid passage and a compressed air passage;

a spray head pivotably mounted to said main housing, said spray head being pivotable between at least first and second positions, said spray head comprising:

a shaft comprising first and second ends;

a compressed air passage in said first end;

a fluid passage in said second end; and

a nozzle assembly attached to said shaft intermediate said ends, said shaft ends rotatably pivoting in said main housing;

means for transferring fluid from said housing to said spray head through said shaft second end and comprising means sealing said main housing fluid passage and said spray head fluid passage in sliding communication with one another and in isolation from the atmosphere;

means for transferring compressed air from said housing to said spray head through said shaft first end and comprising means sealing said main housing air passage and said spray head air passage in sliding communication with one another and in isolation from the atmosphere;

an electrostatic power supply; and

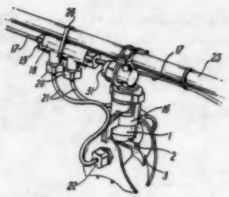
means for transferring electrostatic potential from said power supply to said spray head through said shaft first end.

4,679,735

ELECTROSTATIC SPRAYING APPARATUS

Christopher C. Pay, Woodhall Spa, England, assignor to Crop Control Products Limited, Lincoln, England

Filed Apr. 2, 1986, Ser. No. 847,238
Claims priority, application United Kingdom, Apr. 3, 1985, 8508670
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—708 **11 Claims**



3. A spraying apparatus for spraying a liquid, comprising:

spray nozzle means for directing a spray of a liquid,

at least one electrode disposed adjacent to a path of said liquid emerging from said nozzle said at least one electrode having an elongate configuration perpendicular to said path of liquid emerging from said nozzle,

barrier means disposed generally adjacent to each of said electrodes for minimizing contact of said spray with said electrodes said barrier means further comprising a plurality of pointed protuberances extending outwardly therefrom, and

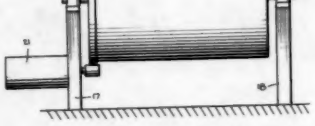
housing means, having a plurality of pointed protuberances depending therefrom, for containing said electrodes therein, said housing means being removably secured to said barrier means by a support member having a plurality of radial baffles extending therefrom, said support member extending from a recess within said housing means.

4,679,736

ROTARY MILL AND A METHOD OF CHARGING THE MILL

John J. Orlando, Rivervale, N.J., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Mar. 15, 1985, Ser. No. 712,570
Int. Cl.[4] B02L *23/02, 17/18*
U.S. Cl. 241—25 **12 Claims**



1. A method for charging material under seal from the atmosphere to a batch-type grinding mill, said mill comprising a rotatably mounted shell having a peripheral wall, means to rotate the shell, a plurality of grinding media within the shell, said mill being operable under a predetermined environment and under seal from the atmosphere, the method comprising:

a. providing the mill with a charging system comprising: at least one charging orifice located in said shell and loading means sealably secured on the peripheral wall of the shell over each charging orifice respectively, each of said load-

ing means comprising a loading conduit with a port of entry at one end and an exit port at the other end, the exit port being aligned and forming a passageway with each orifice respectively for charging material into the shell, and each of said loading means being disposed on the shell to have a substantially vertical loading position when located at the side of the mill with the port of entry essentially above the exit port, thereby providing substantially unencumbered charging path for charge material through the loading means into the shell, and each of said loading means being part of a loading assembly comprising in addition to said loading means a removable sealable plug member for insertion into the loading means in a sealed relationship therewith relative to the atmosphere, a removable, sealable charge tube assembly for insertion into the loading means in sealed relationship therewith relative to the atmosphere, and a loading conduit valve means for sealing the loading means from the atmosphere in the absence of sealing by the plug member and charge tube assembly, thereby permitting interchange of the removeable plug and removable charge tube assembly without breaking the seal in the loading means with respect to the atmosphere; and

b. charging material to the mill using at least one of said loading assemblies;

c. sealing the plug member in the loading means;

d. with the plug member sealed in the loading means, establishing the predetermined environment in the mill;

e. positioning the shell so that the port of entry of the loading conduit is essentially above the exit port;

f. opening the loading conduit valve;

g. retracting the removable, sealable plug member to a sealed position in a retaining section above the loading conduit valve means;

h. closing the loading conduit valve;

i. replacing the removable, sealable plug member in the retaining section with the removable sealable charge tube assembly, the charge tube assembly containing the charge material under seal and now being in sealed relationship with the retaining section of the loading means;

j. opening the loading conduit valve and releasing the seal in the charge tube assembly to flow from the charge tube assembly into the shell; and

k. replacing the charge tube assembly with the plug member.

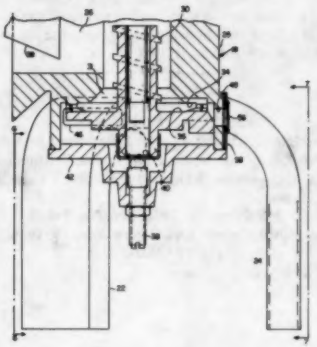
4,679,737

GRINDING SUB-SAMPLING MILL AND METHOD FOR PREPARATION OF TEST SAMPLE

Thomas R. Romer, Washington, Mo., assignor to Romer Labs, Inc., Washington, Mo.

Filed Jun. 12, 1986, Ser. No. 873,678
Int. Cl.[4] B02C *7/11*
U.S. Cl. 241—29 **10 Claims**

1. Apparatus for uniformly grinding a solid foodstuff and obtaining a small representative sample thereof, said apparatus comprising hopper means for delivering discrete particles of said foodstuff to a planetary grinder, said grinder being comprised of a housing supporting a stationary grinder head and a rotary grinder head therein and means for introducing said foodstuff therebetween, said grinder heads being supported within a housing having a multiplicity of separate discharge outlets spaced about the periphery of the grinder heads, said outlets collectively forming a minor portion of the periphery, a major portion of the periphery being closed, one of said outlets having adjustment means for restricting the size of the outlet to provide discharge of a selected small percentage of uniformly ground and uniform composition foodstuff to a sample test collection receptacle, said grinder heads being in a horizontal planes to deliver ground foodstuff horizontally to said discharge outlets, the entire grinder heads lying in a horizontal plane, said outlets being equidistantly spaced peripher-



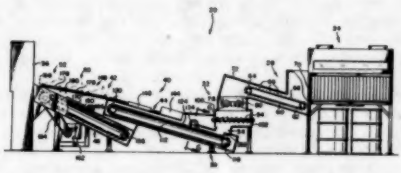
ally around said housing and aligned to bridge outside edges of said heads.

4,679,738

CONVEYOR FOR SORTING RADIOACTIVE WASTE

Anthony J. Prisco, Beverly, and Alfred N. Johnson, Voorhees, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1984, Ser. No. 648,833
Int. Cl.[4] B02C *23/08*
U.S. Cl. 241—101.2 **17 Claims**



1. An apparatus for detecting radioactive components in dry active waste, said apparatus comprising,

means for reducing the waste to pieces of substantially uniform size,

first and second conveyors and a housing for said conveyors,

means for conveying said pieces from said means for reducing the waste to said first and second conveyors,

each of said first and second conveyors including a receiving portion and a discharge portion, said discharge portion of said first conveyor being spaced above and upstream from said receiving portion of said second conveyor to disperse said pieces as they are transferred from said first conveyor to said second conveyor so that said pieces which are in clusters are separated from each other to increase the likelihood of detecting radiation emanating therefrom,

a plurality of radiation detector means for detecting radioactive radiation emanating from said pieces, at least one of said plurality of radiation detector means being located on each of said conveyors, each of said radiation detector means being disposed in close overlying relation to its respective conveyor so that low levels of radiation emanating from said pieces can be detected,

each of said conveyors including means for flattening said pieces of waste before said pieces pass under said radiation detector means, and

said means for flattening being disposed between said receiv-

ing portion of each conveyor and said radiation detector means on each of said conveyors,

said housing being generally closed, and

means for providing a generally closed connection between said housing and said means for reducing the waste so that air that is in said housing and in said means for reducing the waste can be controlled.

4,679,739

VERTICAL ROLLER MILL

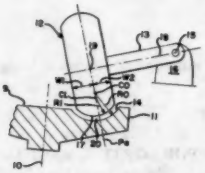
Isao Hashimoto, Akashi; Tosuke Kinoshita; Masahiro Uchida, both of Kobe, and Susumu Uchiyama, Nishinomiya, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 14, 1985, Ser. No. 745,287

Claims priority, application Japan, Jun. 16, 1984, 59-124166

Int. Cl.[4] B02C *15/00*

U.S. Cl. 241—121 **9 Claims**



1. A roller mill comprising a base, a table supported on said base and adapted to be rotated on a substantially vertical axis, said table having an annular groove formed in the top surface thereof, a roller arms means connected to said roller for supporting said roller on said base for rotation on an axis which intersects said vertical axis, said roller having an outer peripheral portion which forms part of a circle of curvature in cross section on the outer side which is radially outward of said table, said roller being adapted when in use to rotate in said groove and to compress material against said groove and rotate with said table, whereby a clearance is formed between said peripheral portion and said groove and said clearance is filled with the material, said roller having a radial plane which passes through the center of said circle of curvature and is fixed circumferentially of said table relative to said base, said roller being axially wider on the radially inward side of said plane than on the radially outward side of said plane and, at least partially on said radially outward side of said table, said annular groove forming part of a circle of curvature and said circle of curvature of said groove being substantially concentric with said peripheral portion of the roller in cross section.

4,679,740

WEDGE-CLAMP ASSEMBLY FOR AN IMPACT CRUSHER

Axel W. Orphall, McMurray, Pa., assignor to Stedman Machine Co., Aurora, Ind.

Filed Jan. 6, 1986, Ser. No. 816,181

Int. Cl.[4] B02C *13/28*

U.S. Cl. 241—189 R **12 Claims**

1. A rotor assembly for use in a crushing machine for reducing material, such as limestone, grain, and ore comprising:

a rotatably mounted shaft,

at least one disc fixedly mounted on said rotatable shaft for rotation therewith, having an outer peripheral surface with opposed outer faces extending radially outwardly from said shaft, in which surface there is located at least one slot,

breaker bar means arranged parallel to the axis of said shaft received in said slot in said disc, and extending radially outwardly from said slot for contacting and impacting against said material,

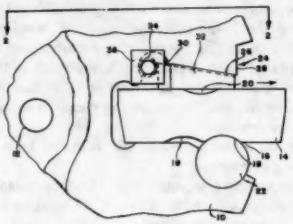
a wedge member arranged in said slot of said disc between an associated surface of said disc and said breaker bar means for engagement therebetween, said surface of said disc cooperating with an engaging surface of said wedge member so that any movement of the wedge member outwardly from said slot in a radial direction increases the holding force between said wedge member and said breaker bar means,

said slot having an enlargement located inwardly from where said wedge member is arranged, and

clamping means for said wedge member associated with said enlargement in said slot,

said clamping means comprising:

elongated means having opposed ends and which is insertable longitudinally in said enlargement of said slot for engagement with said wedge member, and



a restraining member mounted at each said opposed end of said elongated means and constructed and arranged to abut said adjacent surfaces of said disc and to overlap a portion of said wedge member for limiting the movement of said wedge member in a direction perpendicular to said radial direction but allowing relative movement between said clamping means and said wedge member,

said elongated means including restricting means extending through said restraining members associated with said slot in said enlargement for contact by said wedge member in said slot in an initial positioning in a manner that upon operation of said rotor assembly the centrifugal force causes said wedge member to slide out of said initial positioning in said radial direction away from said enlargement of said slot for increasing the holding force of said wedge member against said breaker bar means.

4,679,741

CRUSHER WITH ROTARY PLATES

Kolbjorn Hansen, Hvalstad, Norway, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

PCT No. PCT/NO83/00013, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03779, PCT Pub. Date Nov. 10, 1983

Continuation of Ser. No. 567,852, Dec. 21, 1983, abandoned. This PCT application Apr. 22, 1983, Ser. No. 799,196

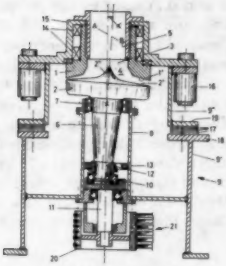
Claims priority, application Norway, Apr. 22, 1982, 821312

Int. Cl.[4] B02C *2/06*

U.S. Cl. 241—206 **16 Claims**

1. A crusher supported by a frame and having a vertical main axis, the crusher including crusher plates (1,2) disposed one above the other with the plates being spaced apart to form therebetween an annular crushing slot (4) with radial outwardly converging crushing surfaces (1',2'), the plates being rotatable about respective axes (A,B) which are non-parallel, the one plate (1) being provided with a central feed opening (3) having a feed funnel (5) projecting downwardly into the opening (3), and the other plate (2) being driven in rotation during operation while simultaneously executing a gyrating movement in a direction opposite to its direction of rotation, characterized in that

the other plate has a center of gravity and includes a downwardly projecting shaft having an upper end, said upper end and a lower end being adjacent said center of gravity and being rotatably and pivotably supported in a first spherical bearing (7), said first bearing having an axis which is coaxial with the axis of rotation of said other plate and being disposed within an upper region of a bearing housing (8) that is rigidly connected to said crusher frame, a lower region of said bearing housing rotatably supporting a rotary driven shaft (11), the lower end of said downwardly projecting shaft being supported in a second spherical bearing (10) that is eccentrically



arranged on an upper end of said driven shaft, the axis of rotation of said driven shaft being coaxial with the axis of rotation (A) of said one plate, and

said downwardly projecting shaft being provided, at said lower end closely adjacent to, and above, said second spherical bearing (10), with a gear wheel (12), said bearing housing (8) including therein an internal rim gear (13), said gear wheel (12) being engaged with said rim gear (13), said gear wheel and said rim gear spacing said downwardly projecting shaft apart from said bearing housing,

so that when the gear wheel (12) rolls on the rim gear (13), said other plate rotates in a direction opposite its direction of gyrating movement.

4,679,742

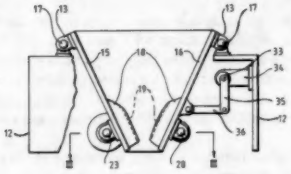
CRUSHER HAVING OPPOSED AND BALANCED DRIVER JAWS

Leslie G. Ellis, Christchurch, New Zealand, assignor to Ian Gordon Rodger, Christchurch, New Zealand

Filed Nov. 18, 1985, Ser. No. 799,301

Int. Cl.[4] B02C *1/06*

U.S. Cl. 241—266 **17 Claims**



1. A crusher including: a pair of opposed crushing jaws, a pivotal mounting of each jaw for pivotal movement towards and away from the other jaw, means for driving the jaws to pivot towards each other simultaneously and away from each other simultaneously, the pivotal mounting of each jaw being adjacent one end of the jaw, the said one ends of the jaws being located opposite each other, the other ends of the jaws being located opposite each other, a drive shaft rotatably mounted on one of the jaws and having eccentric portions, a cross shaft rotatably mounted on the other of the jaws and having eccentric portions, a pair of connecting rods each pivoted at one end on a respective eccentric portion of the drive shaft and pivoted at the opposite end on a respective eccentric portion of the cross shaft, and means for adjusting the distance between the pivots at the ends of the connecting rods.

4,679,743

APPARATUS FOR WINDING CABLE ON CABLE DRUMS

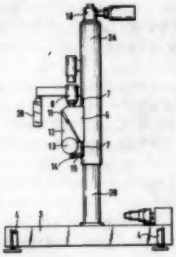
Gunter Dallmaier, Hanover, Fed. Rep. of Germany, assignor to Paul Troester Machinenfabrik, Hanover, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,589

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517696

Int. Cl.[4] B21C *47/24*; B65H *49/24, 54/553*

U.S. Cl. 242—54 R **11 Claims**



1. Apparatus for winding cable on a cable drum comprising;

two telescopic vertical stands each comprising an upper part and a lower part movable vertically relatively to one another, motor means for raising and lowering said upper part relative to said lower part, undercarriage means supporting said lower part vertically and a vertical guideway on said upper part,

a horizontal telescopic traverse connecting said upper parts of said stands with one another with said stands spaced to accommodate a cable drum between them and means for varying the effective length of said traverse to vary the spacing between said stands,

a first slide slidable on said vertical guideway of each of said stands, motor means for moving each of said first slides vertically of the respective guideway and an inclined guideway on each of said first slides, said inclined guideway being at an acute angle to the vertical and to the horizontal,

a second slide slidable on each of said inclined guideways and a spindle on each of said second slides, said spindles being of a size and shape to be received in central holes in opposite sides of a cable drum,

support means on each of said stands below said second slide for engagement by said second slide, and

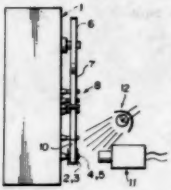
abutments on said inclined guideways of said first slides for engagement by said second slide to limit the movement of said second slides relative to said first slides.

4,679,744

MAGNETIC TAPE WINDING METHOD AND SYSTEM

Hiroshi Chikamasa, and Masaaki Sakaguchi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 13, 1986, Ser. No. 895,937
Claims priority, application Japan, Aug. 19, 1985, 60-181258
Int. Cl.[4] G06K 9/00
U.S. Cl. 242—67.3 R 4 Claims



2. A magnetic tape winding system for winding a predetermined length of magnetic tape around a small winding frame from a magnetic tape feed roll, which comprises:

(i) a winding apparatus for rotating said small winding frame and winding said magnetic tape around said small winding frame at a predetermined speed,

(ii) a camera device for optically imaging a winding surface condition of said magnetic tape wound around said small winding frame,

(iii) a winding appearance judgment device for judging the quality of the winding surface condition of said magnetic tape wound around said small winding frame by a calculation processing of image signals generated by said camera device,

(iv) a winding speed command device for sending a command to said winding apparatus based on results of judgment of said winding appearance judgment device to make said winding apparatus change the speed of magnetic tape winding around said small winding frame, and

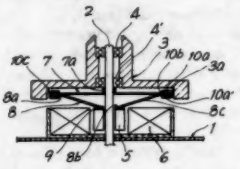
(v) a judgment timing generator for detecting the quantity of said magnetic tape wound around said small winding frame, and activating said winding appearance judgment device when a predetermined quantity of tape is detected.

4,679,745

REEL BRAKE DEVICE OF A VIDEOCASSETTE RECORDER

Kyo S. Kim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul

Filed Jul. 3, 1986, Ser. No. 881,672
Claims priority, application Rep. of Korea, Jul. 3, 1985, 8220/1985[U]
Int. Cl.[4] B65H 23/06
U.S. Cl. 242—75.4 1 Claim



1. A reel brake device of a videocassette recorder, comprising a solenoid mounted on a base plate of a deck of the recorder and arranged around a reel shaft erected on said base plate to be radially spaced from said reel shaft, and a moveable core wire disposed between said solenoid and said reel shaft and below a reel table rotatably supported to an upper portion of said reel shaft, said core wire being actuated by said solenoid, the device being characterized by further comprising:

a disc-shaped supporting plate, fixedly fitted at the opened center portion thereof, to a middle portion of said reel shaft and spaced from a lower surface and inner side surface of said reel table;

a funnel-shaped elastic member disposed just below said supporting plate and slideably fitted, at the opened center portion thereof, to said reel shaft, said elastic member having at outer and inner peripheral edges thereof flat portions one contacting with the lower surface of said supporting plate and the other supporting said moveable core wire, respectively, said elastic member also having a slit radially extended between said outer and inner peripheral edges thereof, so as to be radially expanded in the widening of said slit caused by the upward movement of said moveable core wire; and

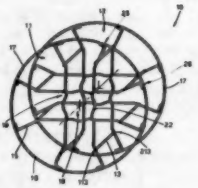
a brake ring disposed between the inner side surface of said reel table and said supporting plate and radially spaced from the inner side surface of said reel table, said brake ring having an annular recess receiving each outer peripheral edge of said supporting plate and elastic member, said brake ring also having a slit radially extending throughout the width thereof, so as to be radially expanded by the expansion of said elastic member, whereby the outer surface of said brake ring can be contacted with the inner side surface of the reel table, in order to brake the rotation of the reel.

4,679,746

REEL TO WIND PACKAGES OF WIRE

Rossano Compagnucci, Osimo, and Ercole Masera, Roveredo in Piano, both of Italy, assignors to Ferriere Nord SpA, Osoppo and Siro SpA, Santa Maria Nuova, both of, Italy

Filed Feb. 19, 1986, Ser. No. 830,950
Claims priority, application Italy, Feb. 19, 1985, 83328 A/85
Int. Cl.[4] B65H 75/20
U.S. Cl. 242—77.2 15 Claims



1. A reel for winding coilable material comprising two opposed reel heads joined by cross members, each head comprising a plurality of bent filiform elements disposed essentially in a single plane, each element comprising:

(a) a substantially U-shaped member having a base and first and second legs, one of said legs forming a substantially planar angular portion with said base and the other leg forming an axially bent angular portion with said base; and

(b) a substantially arcuate circumferential member extending from said first leg that incldues a seating means in the same plane as said circumferential member adjacent to said first leg;

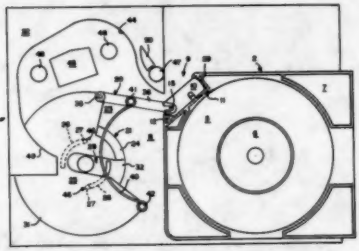
the end of said circumferential member welded to the seating means of an adjacent circumferential member in the same reel head to form a substantially circular continuous periphery for said reel head, said planar angular portion being superposed on, and welded to, an adjacent axially bent angular portion in the same reel head to form a continuous hub for said reel head, the cross members being joined to legs of the opposed reel heads.

4,679,747

APPARATUS FOR LOADING AND UNLOADING THE LEADER BLOCK OF A TAPE CARTRIDGE

Jay A. Smith, Harleysville, Pa., assignor to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Mar. 21, 1986, Ser. No. 842,446
Int. Cl.[4] G11B *15/32, 23/04*
U.S. Cl. 242—195 12 Claims



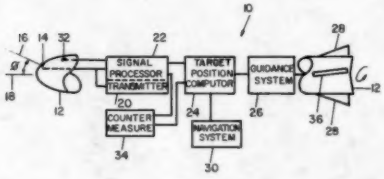
1. In a transport apparatus for receiving and operating upon a tape cartridge including a web of tape disposed on a supply reel and having a free end engaged by a leader block, said leader block having an engagement slot and said transport apparatus including a take-up reel for receiving said leader block, an improved leader block loading means comprising a linkage for engaging the slot of said leader block and for delivering said engaged leader block to the take-up reel of said transport apparatus, and means responsive to rotation of said take-up reel for operating said linkage.

4,679,748

CANNON-LAUNCHED PROJECTILE SCANNER

Ake Blomqvist, Hedgatan 21, 691 35 Karlskoga, Sweden, and James Linick, 99 rue de La Faisanderie, 75 116 Paris, France

Filed Jun. 25, 1984, Ser. No. 624,631
Claims priority, application Sweden, Jul. 5, 1983, 8303830
Int. Cl.[4] F41G *7/00*
U.S. Cl. 244—3.19 11 Claims



1. A cannon-launched projectile, comprising in combination:

radar means including an antenna fixed at a predetermined angle with respect to the axis of the projectile;

said radar means including means for processing information received by said antenna to detect and select a potential target;

said radar means also comprising several range gate means to obtain a good signal to clutter ratio;

said radar means further comprising target position computer means for computing the location of the target selected by said processor means; and

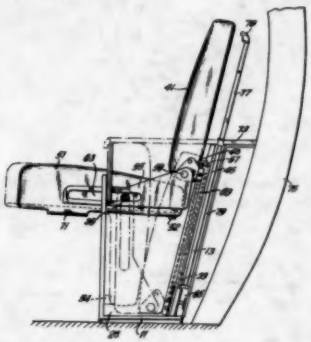
guidance system means including one or more guidable fins to alter the direction of flight of the projectile based upon directional information received from said target position computer means.

4,679,749

AUXILIARY AIRPLANE SEATS

James M. Ryan, and Arthur H. Gilmore, both of New York, N.Y., assignors to Falcon Jet Corporation, Teterboro, N.J.

Filed Sep. 28, 1984, Ser. No. 655,526
Int. Cl.[4] B64D *11/06*
U.S. Cl. 244—122 R 12 Claims



1. An auxiliary airplane seat comprising in combination a containment unit including a bottom member, a substantially vertical, upwardly extending rear panel, at least two vertical, upwardly extending side panels and a vertical, upwardly extending front panel attached to said bottom member and forming a housing, a pair of spaced, parallel guide means located on said rear panel, guiding means disposed on each of said side panels, a substantially vertically movable seat back member provided with linking means including guide pins adapted to cooperate with the guide means located on said rear panel disposed in said containment unit adjacent said rear panel, a substantially vertically upwardly and horizontally movable seat bottom member disposed in said containment unit in front of said seat back member including a pair of slotted track means located along the sides thereof which are pivotally connected to the linking means of said seat back member and the guiding means on said side panels disposed in the slots of said track means, whereby said seat back moves substantially vertically upwardly in said containment unit when said seat bottom is moved substantially vertically upwardly and horizontally and the track means located along the sides of said seat bottom member, slide past and pivot about said guiding means on said side panels which are disposed in the slots of said track means.

4,679,750

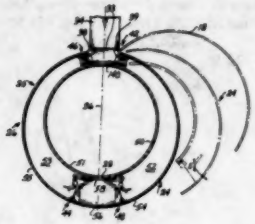
LATCH SYSTEM

Frank M. Burhans, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1984, Ser. No. 622,580
Int. Cl.[4] B64D *29/06*
U.S. Cl. 244—129.4 34 Claims

1. A latch system for an aircraft nacelle, the nacelle comprising first and second cowls, each cowl being hingedly mounted to the nacelle for pivotal movement between a closed position adapted for aircraft operation and one or more open positions wherein access is provided to interior portions of the nacelle, the first and second cowls being positioned adjacent and in side-to-side relationship with one another, the first cowl including a first edge along which the first cowl is hingedly mounted to the nacelle, the latch system comprising latch means movable to and from a latched position in which the latch means is connected to the first cowl at the first edge and holds the first cowl in its closed position and prevents the first cowl from moving to an open position, the latch means includ-

ing locking means associated with a second cowl for holding the latch means in its latched position when the second cowl is



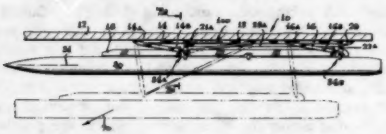
in its closed position, whereby the first cowl is held in its closed position when the second cowl is in its closed position.

4,679,751

WEAPON DISPENSING SYSTEM FOR AN AIRCRAFT

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Apr. 29, 1986, Ser. No. 857,004
Int. Cl.[4] B64D *1/06*
U.S. Cl. 244—137.4 **9 Claims**



1. A weapon dispensing system for ejecting a weapon from an aircraft comprising:

weapon positioning means for positioning the weapon in a stored position and a release position comprising:

a weapon support rack; and

fore and aft links having first and second ends, said first ends of said fore and aft links pivotally coupled to the aircraft and said second ends of said fore and aft links pivotally coupled to said rack;

an actuator means having a first end coupled to the aircraft and a second end coupled to said weapon positioning means, said actuator means for moving said weapon positioning means from the stored position to the release position; and

fore and aft weapon attaching means for releasably locking the weapon to said rack comprising: the weapon having fore and aft mounting lugs; fore and aft hook means rotatably mounted to said rack moveable from a first position in engagement with said fore and aft mounting lugs, respectively, to a second position disengaged therefrom;

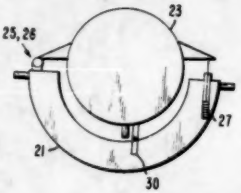
fore and aft wedge members mounted to said positioning means for engaging with and locking said fore and aft hook means in said first position when said positioning means is in said stored position and disengaging from and unlocking said fore and aft hook means when said positioning means is in said release position allowing said fore and aft hook means to move from said first position to said second position disengaged from said lug means.

4,679,752

PAYLOAD DEPOLYMENT FROM SHUTTLE EMPLOYING AN EJECTION RESTRAINT DEVICE

Alois Wittmann, Palos Verdes; Theodore M. Isaacs, and John R. Murphy, both of Fountain Valley, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 28, 1985, Ser. No. 695,156
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R **10 Claims**



1. Apparatus for use in the gyroscopic ejection of a spacecraft from a support structure, said support structure comprising a spacecraft supporting cradle having an open end, said spacecraft straddling said open end, said apparatus further comprising an ejecting mechanism for applying a tangential thrust force to one side of said spacecraft, said apparatus comprising:

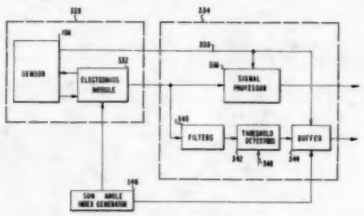
a separable ejection restraint mechanism having one end attached to said cradle and the other end attached to said spacecraft for restraining said thrust force applied to said spacecraft for a predetermined time period in order to dissipate undetermined forces acting upon said spacecraft prior to the ejection thereof.

4,679,753

SURVEYING SATELLITE INCORPORATING STAR-SENSING ATTITUDE DETERMINATION SUBSYSTEM

Peter B. Landecker, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 21, 1984, Ser. No. 643,130
Int. Cl.[4] B64G *1/36*
U.S. Cl. 244—171 **8 Claims**



1. A system for surveying features of a planet, said system comprising:

a spacecraft;

a sensor for producing a signal in response to radiation from a source, the amplitude of said signal corresponding to the radiation flux at the sensor produced by the source, said sensor being located onboard said spacecraft;

means for alternately directing said sensor toward said planet and toward a predetermined star field;

means for analyzing said sensor signal when said sensor is directed toward said planet to provide surveying information concerning said features of said planet;

a buffer for storing star field data signals from said sensor;

star field data compression means for selecting signals from said sensor when said sensor is directed toward said star field, said signal selection being performed to optimize the number of star detections and avoid saturation of said buffer; and

means for analyzing said selected signals to provide sensor attitude information.

4,679,754

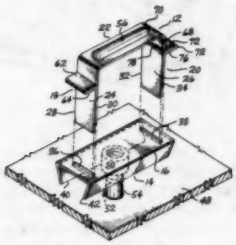
CONNECTOR ASSEMBLY FOR SECURING CABLES, PIPES, OR THE LIKE TO A SUPPORT STRUCTURE

Peter S. Richards, 100 Mt. Si Pl. NW., Issaquah, Wash. 98027

Filed Jul. 28, 1986, Ser. No. 889,929

Int. Cl.[4] F16L *3/22*

U.S. Cl. 248—68.1 **12 Claims**



1. A connector assembly for securing cables, pipes, or the like, to a support structure, comprising:

a U-shaped retainer comprising a pair of spaced apart sidearms, and a cross member, each said sidearm having opposite edges; and

a base member comprising a support portion, a pair of slots in said support portion, spaced apart a distance corresponding to the spacing of the sidearms, each said slot being sized to receive a related one of said sidearms, and a pair of laterally spaced apart grip jaws offset from the support portion, and positioned to receive between them the sidearms after the sidearms have passed through said slots, said grip jaws being spaced apart a distance less than the width dimension of the sidearms, so that the sidearms have to be forcibly moved through the space between the grip jaws,

whereby an object or objects to be supported may be positioned on the support portion of the base member, between said slots, and then the U-shaped retainer can be moved toward the base member, to place the sidearms of the retainer in said slots, and then the U-shaped retainer can be pushed upon to move the sidearms through the slots until the cross member is generally against said object or objects, and the grip jaws of the base member will dig into and grip the edges of the sidearms, to in that manner securely connect the U-shaped retainer to the base member, and hold the object or objects secure between the U-shaped retainer and the base member.

4,679,755

SUPPORT DEVICE FOR THIN-WALLED TUBING

Jean-Jacques Marsault, Saint Arnoult en Yvelines; Jean-Pierre Peyrelongue, Pontchartrain; Jean-Claude Semedard, Paris, and Gérard Vallee, Viroflay, all of France, assignors to Stein Industrie, France

Filed Jun. 5, 1985, Ser. No. 741,408

Claims priority, application France, Jun. 5, 1984, 84 08788

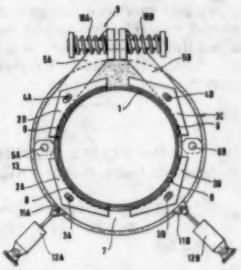
Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—74.1 **6 Claims**

1. A fixing device for a pipework (1) having a cylindrical wall which is thin relative to its diameter and subjected to large temperature variations and to radial forces in arbitrary directions, said device comprising:

a. sectional support cradles (2A, 2B, 2C, 2D) having pipework contacting faces;

b. a rigid half-collar (7) for disposal around the periphery of the pipework, and having some of the cradles mounted thereto;



c. two arms (5A, 5B) hinged at their ends to respective ends of the half-collar and having others of the cradles mounted thereto; and

d. a flexible arm clamping device (9) resiliently mounted to said two arms for drawing said arms together to apply the cradles against the pipework, independently of expansions and radial forces applied to the pipework.

4,679,756

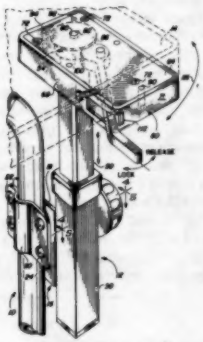
MOUNTING FOR A WHEELCHAIR SERVICE TRAY

Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85345

Filed May 14, 1986, Ser. No. 863,048

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—285 **7 Claims**



1. Apparatus for supporting a tray upon a piece of furniture, said apparatus comprising in combination:

(a) a mounting for supporting the tray with respect to a piece of furniture;

(b) means for attaching said mounting to a segment of the piece of furniture;

(c) a stanchion vertically positionable with respect to and in engagement with said mounting to permit vertical positioning of the tray, said stanchion being non-rotatable about its longitudinal axis during and after vertical positioning, said stanchion including a head having a cylindrical surface;

(d) a cam unit for supporting the tray upon said stanchion

and for regulating pivotal movement of the tray about the longitudinal axis of said stanchion;

(e) means for capturing said head within said cam unit to support said cam unit upon said head; and

(f) said cam unit including a cam for interacting with any circumferential part of said cylindrical surface to restrict rotation of said cam unit and the attached tray in one direction and an arm responsive to manipulation for disengaging said cam with said cylindrical surface to permit rotation on a selective basis of said cam unit and the attached tray in the other direction;

whereby, the tray is vertically and pivotally positionable with respect to the piece of furniture.

4,679,757

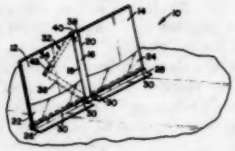
ADJUSTABLE BOOKHOLDER

Fred P. Mussari, 14456 Portland Ave. S., Burnsville, Minn. 55337

Filed May 16, 1986, Ser. No. 864,296

Int. Cl.[4] A47B *97/08*

U.S. Cl. 248—463 **3 Claims**



1. An adjustable bookholder, which comprises:

a pair of covers secured to opposite edges of an intermediate spine for relative pivotal movement between opened and closed positions;

said spine and covers each having inside and outside surfaces and upper and lower edges;

ledge means secured to the lower edges of said covers for supporting bound or unbound materials thereon;

a rigid first member pivotally secured at one end to the upper edge of said spine for pivotal movement between extended and retracted positions;

a flexible but substantially inextensible second member secured at one end to the other end of said first member;

a releasable first connector secured to the lower inside surface of said spine for releasable engagement with said cross member for adjusting the desired angle of inclination of the bookholder; and

releasable second and third connectors secured to opposite ends of said first member for releasable engagement with the said other ends of said first and second members, respectively to retain said members in retracted position.

4,679,758

EXTERIOR REARVIEW MIRRORS FOR VEHICLES

Ian Boddy, Bognor Regis, and Shaun Gurteen, Chichester, both of England, assignors to Britax Wingard Limited, Chichester, England

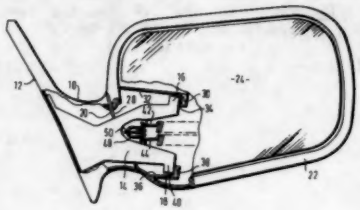
Filed Jul. 23, 1985, Ser. No. 758,475

Claims priority, application United Kingdom, Aug. 18, 1984, 8421050; May 29, 1985, 8513552

Int. Cl.[4] A47G *1/24*

U.S. Cl. 248—479 **9 Claims**

1. An exterior mirror for a vehicle comprising a base member having a mounting face adapted to engage with the vehicle body, first pivotal engagement means mounted on an arm secured to the base member so as to project laterally in the opposite direction to the mounting face, a housing for a reflective member having second pivotal engagement means, a first link pivotally attached to the base member at a point which is nearer to the mounting face than the first pivot axis, a stop on the first link a stop arranged to engage with a formation on the base member to limit pivotal movement of the link, a second link pivotally attached to the first link, and resilient means for urging the first and second pivotal engagement means into engagement with one another so that the housing is pivotally movable relative to the base member about a pivot axis formed by said first and second pivotal engagement means, the resilient



means extending between the second link and a point in the interior of the housing which is further from the mounting face than said pivot axis when the housing is in its position of normal use, and the links being movable between a first position in which the line of action of the spring pulls the housing towards its position of normal use and the second link engages with a formation on the base member to limit pivotal movement of the links, and a second position in which the spring pulls the housing towards the mounting face and the stop on the first link engages with the base member.

4,679,759

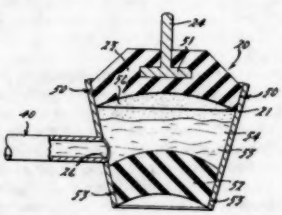
ASSEMBLY FOR MOUNTING A VIBRATING BODY

David M. Ford, Northville Township, Wayne County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,690

Int. Cl.[4] F16M *7/00*; F16F *5/00*

U.S. Cl. 248—562 **17 Claims**



15. An engine mounting system mounting an internal combustion engine to a support structure of a motor vehicle, said engine having a primary torsional displacement axis, said engine mounting system comprising a plurality of engine mounts, each of at least two of said engine mounts comprising:

(A) a substantially rigid housing forming a frustro-conical sleeve open at a first, larger diameter end and open at a second, smaller diameter end, said housing having an inside surface and an outside surface and having a fluid flow port therethrough, said housing being rigidly attached to said support structure;

(B) a first deformable elastomeric body sealingly bonded to the inside surface of said housing at said first open end of said housing, forming a fluid-tight closure of said first open end;

(C) rigid attachment means fixedly coupled to said first

elastomeric body and rigidly engaging an engine member which is rigidly integral with said engine;

(D) a second deformable elastomeric body sealingly bonded to the inside surface of said housing at said second opening end of said housing, forming a fluid-tight closure of said second open end, said second elastomeric body being of higher hysteretic damping value than said first elastomeric body, wherein, in each of said at least two engine mounts, said housing, said first elastomeric body and said second elastomeric body together define an elasticly expandable chamber; and

(E) a conduit sealingly attached at one end to the fluid flow port of one said engine mount and sealingly attached at another end to the fluid flow port of at least one other said engine mount, said conduit and said fluid flow ports permitting flow of fluid between the chamber of said one engine mount and said other engine mount, which two chambers together with said conduit form a continuous, fluid-tight enclosure, said one engine mount and said other engine mount being oriented in a plane substantially orthogonal to said primary torsional displacement axis of said engine.

4,679,760

SPRING ARRANGEMENT

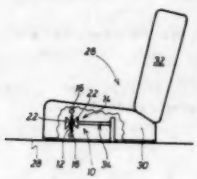
Josef Dotzler, Amberg, and Johann Meier, Fensterbach/Wolfring, both of Fed. Rep. of Germany, assignors to Grammer Sitzsysteme GmbH, Amberg, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,767

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517345

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—602 **5 Claims**



1. A spring arrangement comprising a resilient coil spring having first and second ends fixed relative to each other, and a spring-engaging member adapted to act on the spring between said first and second ends of the spring in an actuating direction which differs from the longitudinal direction of the spring, said engaging member comprising first and second interconnected elements which are disposed in mutually opposite relationship at substantially the same level on respective sides of said spring, each said element having a surface of a curved configuration which is adapted to bear against said spring and which extends over a plurality of turns of said coil spring, thereby to provide non-linear dependency of the spring force on the relative distance covered as between said engaging member and said spring.

4,679,761

VIBRATION DISSIPATION MOUNT FOR MOTORS OR THE LIKE

Thomas R. Small, Brookeville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 21, 1981, Ser. No. 313,246

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—609 **8 Claims**

1. A vibration dissipation mount for a flywheel assembly comprising:

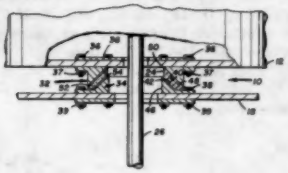
a flywheel;

a rotating shaft connected at a first end to said flywheel;

a flywheel chamber which encloses said flywheel and into which said rotating shaft passes;

a motor connected to a second end of said rotating shaft for driving said flywheel;

a pair of complementary plates, one of said plates having a convex surface, the other of said plates having a complementary concave surface, each of said plates having an



aperture extending through said complementary surfaces thereof, said apertures being dimensioned to accommodate there through and to permit free rotation of said rotating shaft when said plates are disposed in complementary relationship, one of said plates being affixed to said motor, the other of said paltes being affixed to said flywheel chamber; and

a cushioning means being disposed between said plates.

4,679,762

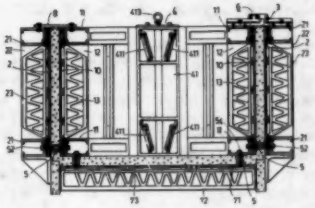
FORM SET-UP

Yuan-Ho Lee, No. 851, Chung-San Road, Nan-Pao Tsun, Kuei-Jen Hsian, Tainan Hsieng, Taiwan

Filed Dec. 14, 1984, Ser. No. 681,778

Int. Cl.[4] B28B *7/30*; E04B *1/16*; E04G *11/06*

U.S. Cl. 249—26 **4 Claims**



1. An inner form set-up for molding the inner surfaces of a closed multi-sided concrete wall structure comprising:

vertical form walls connected to each other, each of said form walls acting to mold one side of the concrete wall structure, each form wall comprising two portions;

wedge means provided between said two portions of each of said form walls and extending vertically along the full length of said form wall, said wedge means including two first wedge members each having a first vertical panel fixedly abutting one of said portions, a second vertical panel connected to said first panel and flush with a molding surface of said portions of said form wall, and a third vertical panel connected to said second panel and inclined to said first and second panels, and a second wedge member for insertion horizontally between said first wedge members to place said form walls in a molding position and for retraction outward to contract said form walls, said second wedge member having two opposite first panels which are inclined at the same inclination to that of said third panels of said first wedge members and a second panel interconnecting said first panels of said second wedge member;

a rack-and-gear mechanism interengaging said first and second wedge members for moving said second wedge

member horizontally relative to said first wedge members; and

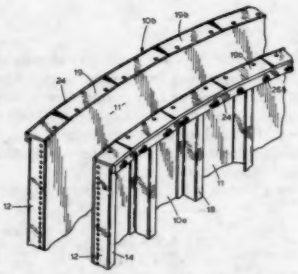
guide means for causing said two portions of each of said form walls to approach each other or to move away from each other when said second wedge member moves.

4,679,763

CONCRETE FORM HAVING ADJUSTABLE CURVATURE AND METHOD FOR PRODUCING SAME

Thomas W. Brotherton, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed Aug. 22, 1985, Ser. No. 768,201
Int. Cl.[4] E04G 9/02
U.S. Cl. 249—189 **6 Claims**



1. A concrete form having a flexible panel member with an upstanding perimetral flange projected laterally from one side thereof and wherein said flange has a pair of transversely opposite side sections disposed on opposite ends of said form each of which side sections has a flat terminal surface portion extended inwardly in a direction parallel to said one side of the form, the improvement wherein:

(a) each of said opposite flange side sections is divided into a plurality of segments by a plurality of notches longitudinally spaced over the length thereof, with each notch terminating in a V-shape portion having the apex thereof adjacent said one side of the panel member whereby said panel member is laterally flexibly movable to a preselected generally curve shape, and

(b) means secured to the terminal surface portions of said flange segments to maintain the pre-selected curved shape of said panel.

4,679,764

AUTOMATIC VALVE ACTUATOR AND CONTROL SYSTEM

Gordon M. Smith, La Habra Heights; Fred G. Chase, Sr., La Habra, and Gerard E. Ducharme, Fullerton, all of Calif., assignors to Johnston Pump/General Valve, Inc., Glendora, Calif.

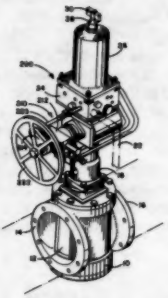
Continuation-in-part of Ser. No. 477,084, Mar. 21, 1983, abandoned. This application Aug. 6, 1984, Ser. No. 638,194
Int. Cl.[4] F16K 31/124, 31/14
U.S. Cl. 251—14 **8 Claims**

1. An improved valve actuator control system adapted for use with a plug-type valve and an operator for opening and closing the valve, the actuator of the type having a motor, a power source for activating the motor for motor shaft rotation is in either direction, and means for sensing whether the valve is opened or closed for stopping the motor when the selected flow configuration of the valve is achieved, the improvement comprising:

manual motor override means having means for manually engaging said motor shaft for opening and closing said valve when said power source is not available for activating said motor, and

power source bypass means connected to said motor override means for automatically disengaging said power source from said motor for preventing injury when said power source becomes available for activating said motor while said motor shaft is manually engaged,

said manual motor override means comprising a splined receptacle moveable axially with respect to said motor



shaft and wherein said motor shaft is splined for selective engagement and disengagement with said receptacle,

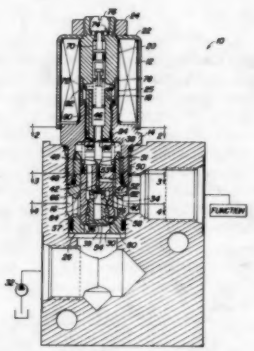
said override means comprising a rotatable cam pin having cam roll pins, and a guide having cam slots for receiving said roll pins, said guide being mechanically connected to said splined receptacle.

4,679,765

LOW LEAKAGE ORIFICE-CONTROLLED POPPET VALVE

Kenneth D. Kramer, Waterloo, Iowa, and Rohn L. Olson, North Richland Hills, Tex., assignors to Deere & Company, Moline, Ill.

Filed Apr. 14, 1986, Ser. No. 853,312
Int. Cl.[4] F16K 31/122
U.S. Cl. 251—38 **11 Claims**



1. In a pilot-operated control valve having a housing defining a fluid inlet and a fluid outlet, a main valve member movable in the housing to control fluid communication between the inlet and the outlet, the main valve member having a pilot passage therein extending between the inlet and outlet and having a pilot valve seat surrounding a portion of the pilot passage, the control valve also having a pilot poppet engageable with the pilot valve seat and movable in relation thereto to control fluid communication through the pilot passage to thereby control movement of the main valve member, and

having means for hydrodynamically balancing the pilot poppet, characterized by:

the pilot poppet being a solid member; and

the balancing means being completely received by the main valve member.

4,679,766

SOLENOID BOOSTER

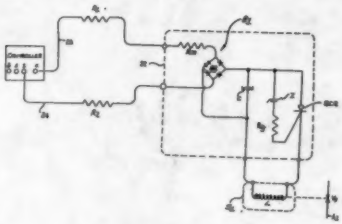
Kenneth J. Cuming, 68 Robinson Road, Hawthorn, Victoria, Australia

Filed Apr. 29, 1985, Ser. No. 728,567

Claims priority, application Australia, May 1, 1984, PG4778

Int. Cl.[4] F16K *31/06*; H01H *47/04*

U.S. Cl. 251—129.04 **9 Claims**



6. A water supply control system comprising:

at least one valve means adapted to be arranged within a water supply line to control the flow of water in the supply line;

a solenoid operatively connected to and controlling operation of each of said valve means;

a controller means, including an alternating current power supply, electrically connected to each said solenoid; and

a solenoid control device electrically interposed between said controller means and at least one said solenoid, said solenoid control device being arranged to receive power from said power supply and to be located electrically adjacent to or integral with its associated solenoid, said solenoid control device comprising a circuit means for electrically connecting said device to the solenoid, a direct current charge storage means connected in said circuit in parallel to the solenoid, a rectifier means connected in said circuit for providing a direct current supply to said direct current charge storage means from said alternating current power supply, monitoring means for determining when the storage means has reached a desired charge sufficient to energize the solenoid, and switching means connected in said circuit for automatically passing current stored by said storage means to the solenoid in response to said monitoring means determining that said storage means has reached a desired charge to thereby energize the solenoid.

4,679,767

SOLENOID ARRANGEMENT INCLUDING YOKE-ENCLOSED COIL AND DOUBLE ENCAPSULATION

David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Nov. 12, 1985, Ser. No. 796,757

Int. Cl.[4] F16K *31/06*; H01F *5/06, 7/16*

U.S. Cl. 251—129.15 **14 Claims**

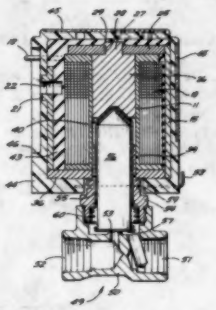
1. A solenoid arrangement comprising:

a coil of electrically conductive wire,

a yoke of magnetic material surrounding the coil,

the coil being completely encapsulated by a thermosetting resin, the resin being located between the coil and the yoke, and

the yoke being substantially completely encapsulated on all sides by a thermoplastic resin, so that none of the thermosetting resin is exposed on the exterior of the solenoid arrangement.



4,679,768

VALVE

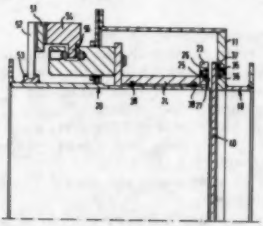
Derrick Hardy, Lowdham, England, assignor to Bercorit & Herweg Limited, Arnold, England

Filed Jul. 18, 1985, Ser. No. 756,232

Claims priority, application United Kingdom, Jul. 18, 1984, 8418349

Int. Cl.[4] F16K *25/00*

U.S. Cl. 251—159 **7 Claims**



1. A valve for controlling passage of a fluent medium, comprising:

a first duct section having an axis and an end;

a second duct section having an axis and an end, said second duct section being disposed so that its axis substantially coincides with said axis of said first duct section and so that its end is spaced apart from said end of said first duct section to provide a gap between said ends;

a rotatable shaft having an axis, said shaft being disposed outside said duct sections with its axis parallel to said axes of said duct sections;

a valve plate mounted on said shaft and perpendicular to said axis thereof, said plate being positioned to engage said gap;

a first annular flange affixed to said first duct section;

a sleeve slidably mounted around said second duct section, said sleeve having a second annular flange that faces said first annular flange;

an annular element rotatably disposed around said second duct section;

selectively operable means for rotating said annular element and said shaft in concert;

cam means operatively connecting said annular element and said sleeve for sliding said sleeve in a predetermined cycle when said annular element is rotated, said cycle including a first stage wherein said second flange is withdrawn from said gap as said valve plate rotates and a second state wherein said second flange is forced against said valve plate as said valve plate rests in said gap; and

annular sealing means for resiliently sealing said valve plate to at least one of said flanges during said second stage of said predetermined cycle.

4,679,769

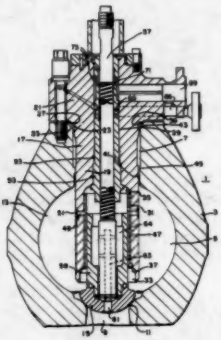
STEAM TURBINE CONTROL VALVE FOR CYCLIC DUTY

Suryakant K. Dawawala, Casselberry, Fla., and Bernard L. LaCoste, Wilmington, Del., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 770,379, Aug. 29, 1985, abandoned, which is a continuation of Ser. No. 635,376, Jul. 27, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 936,926

Int. Cl.[4] F16K *1/32*

U.S. Cl. 251—282 **6 Claims**



1. A turbine control valve comprising:

a body having a cavity disposed therein, the cavity having an elongated generally round first opening on one side of the cavity, the first opening having a circumferential sealing surface adjacent thereto, a generally round second opening with a valve seat disposed therein on a side opposite the first opening, and a third opening for admitting steam to the cavity;

a valve plug which mates with the valve seat to close off the second opening;

a bonnet having a generally cylindrical portion with an integral flange on one end of the cylindrical portion, the flange having a circumferential seal surface which mates with the circumferential sealing surface adjacent the first opening, the bonnet having a centrally disposed bore extending therethrough with two counter bores extending inwardly from the end without the flange, the first counter bore being long and terminating with a large fillet radius, the second counter bore being sufficiently deep to receive the plug and also terminating with a fillet radius, the cylindrical portion having a first raised land on the outer surface adjacent the flange and a second raised land on the outer surface and spaced from the first land and the first raised land being larger in diameter than the second raised land;

the first opening in the body also having raised first and second lands which respectively mate with the first and second lands on the cylindrical portion of the bonnet in such a manner that there is a low clearance between the mating lands;

a hardened sleeve tightly fit into the first counter bore in the bonnet;

a stem guide bushing fastened in the bore of the bonnet;

a valve stem slidably disposed in the stem guide bushing;

a plug guide slidably disposed in the hardened sleeve and on the valve stem and affixed to the valve plug so that the sliding motion between the valve stem and the plug guide is small;

the valve plug having a centrally disposed port extending therethrough which cooperates with the valve stem to provide means for reducing the force required to remove the plug from the seat to form a control valve operable for cyclic duty where large temperature changes occur at the plug.

4,679,770

GATE VALVE FOR TWO WAY FLOW

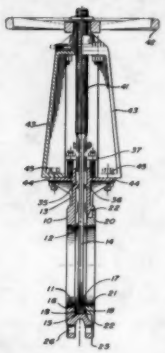
Richard Liberman, Montreal, Canada, assignor to Crane Canada Inc., Montreal, Canada

Filed Feb. 10, 1986, Ser. No. 827,878

Claims priority, application Canada, May 9, 1985, 481186

Int. Cl.[4] F16K *3/02*

U.S. Cl. 251—328 **5 Claims**



1. A gate valve for two way flow comprising, a rigid valve body having a flow passage with smooth curved walls therethrough, the body having a gate blade slot in the approximate center of the flow passage, a flexible resilient seat flush with the smooth curved walls, the seat being in the form of a strip extending through one end of the gate blade slot, around the flow passage and through the other end of the gate blade slot, a body port insert ring attached and sealed to the valve body, the body port insert ring holding said resilient seat in place, a gate blade with a semicircular end, the gate blade adapted to fit in the gate blade slot to seal against the resilient seat, the strip forming the resilient seat extending on both sides through the gate blade slot and providing edge seals for edges of the gate blade, the strip at the location of the edge seals having an aperture extending down the strip on each side in line with the edges of the gate blade and elongated members for insertion into the apertures to expand the edge seals and provide a seal between the edges of the gate blade and the edge seals.

4,679,771

CABLE TENSION SENSING APPARATUS

Bruce S. Johnson, Dallastown, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

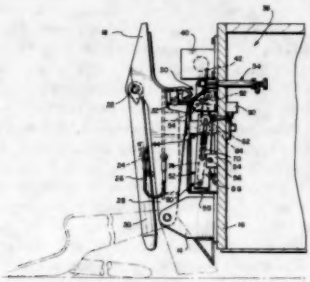
Filed Jan. 11, 1985, Ser. No. 690,532

Int. Cl.[4] B66D *1/50*

U.S. Cl. 254—273 **22 Claims**

1. Apparatus for maintaining the tension in a winch-controlled cable between minimum and maximum tension limits comprising a housing pivotally supported on a member for movement between first and second rotational positions, the housing having entrance and exit openings therein for the cable; first biasing means for biasing the housing to the first rotational position; a slidable pulley rotatably disposed within the housing with respect to the entrance and exit openings so as to enable the cable to be passed around the pulley and so as to cause the housing to pivot away from said first rotational position in accordance with the tension on the cable, second biasing means within the housing for biasing the pulley away from the entrance and exit openings for the cable, the first biasing means being selected such that the first rotational position of the housing corresponds to the minimum cable tension limit and such that the second rotational position of the

housing corresponds to the maximum cable tension limit; first means for detecting the housing being at the first rotational position and for preventing operation of the winch to unwind



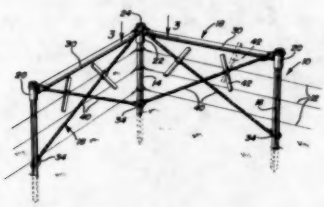
the cable therefrom; and second means for detecting the housing being at the second rotational position and for preventing operation of the winch to wind up cable.

4,679,772

WIRE FENCE POST BRACING SYSTEM

Duane G. Peterson, Box #22, Dutton, Mont. 59433

Filed Jul. 17, 1986, Ser. No. 886,335
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—36 **5 Claims**



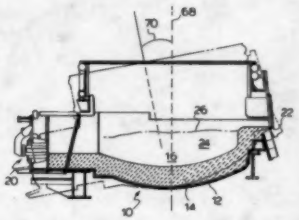
1. In combination with a fence including first and second adjacent fence posts having upper and lower end portions, a fence bracing system including first and second brace anchors removably supported from the upper end portions of said first and second posts, respectively, and including fence rail support members projecting toward each other, a rigid fence rail having opposite ends, said opposite ends and support members being telescopingly engaged for support of said fence rail ends from said support members, a tension wire anchor member engaged with the lower end portion of each of said posts, two pairs of at least two-strand sections of wire, each pair of wire strand sections having a first pair of corresponding end portions anchored relative to a corresponding anchor member and a second pair of end portions anchored relative to the upper end portion of the other post, a pair of elongated lever members each passing between the longitudinal mid-portions of a corresponding pair of wire strand sections and manually displaceable about an axis extending along said corresponding pair of wire strand sections and disposed transverse to the lever for twisting said corresponding pair of wire strand sections about each other and thereby adjustably shortening the effective length thereof to form an inclined tensioned connection between upper and lower end portions of said posts and with said pairs of twisted wire strand sections crossed and oppositely inclined relative to each other, said brace anchors each comprising an upstanding tubular member including an at least partially closed upper end, said tubular members each being downwardly telescoped over and abutted against the upper end portion of the corresponding post, those pairs of strand section end portions anchored relative to the upper end portions of said posts each being anchored thereto by being passed about the corresponding tubular body above the corresponding fence rail end and also being looped over said corresponding fence rail end.

4,679,773

HORIZONTAL TAPPING FURNACE AND METHOD OF OPERATION

Edgar R. Wunsche, 682 Bermuda, Oshawa, Ontario, Canada (L1J 6A8)

Filed Sep. 30, 1985, Ser. No. 782,136
Int. Cl.[4] C21B *11/00*
U.S. Cl. 266—45 **13 Claims**



6. A metallurgical furnace including:

a furnace floor and a furnace wall means extending generally upwardly about said floor, said furnace having a vertical axis and a horizontal axis, means mounting the furnace for pivotal tilting movement about said horizontal axis between a non-tilted, normal upright position, and a tilted discharge position with said furnace tilted less than 15° to said vertical axis,

a hearth zone defined between said floor and wall means adapted to house a bath of liquid metal of predetermined volume, said hearth zone having an upper end defining a predetermined upper level for said bath and for a layer of liquid slag floating on said upper level, when said furnace is in a non-tilted, normal upright position,

said hearth zone having a lower end adjacent said floor,

a tapping passage extending through said wall means from a liquid metal discharge outlet at an outer end into said lower end of said hearth zone, at an inner end, said discharge outlet being defined by an outwardly facing passage wall and said passage at said outer end,

said tapping passage being disposed generally parallel to said horizontal axis and vertically below said predetermined upper level, when said furance is in said non-tilted, normal, upright position,

a discharge outlet closure having a closure surface and being pivotally mounted externally of said passage for pivotal to and fro movement towards and away from said furnace wall means between a first position in which said closure surface engages said passage wall at said outer end to fully close said discharge outlet, and a second position spaced apart from said passage wall.

4,679,774

FLUID CONDUIT COUPLING FOR A METALLURGICAL CONVERTER TRUNNION

Craig J. Lawrence, Nazareth, and John J. Ferriola, Fogelsville, both of Pa., assignors to Bethlehem Steel Corp.

Filed Nov. 13, 1985, Ser. No. 797,567
Int. Cl.[4] C21C *5/50*
U.S. Cl. 266—246 **6 Claims**

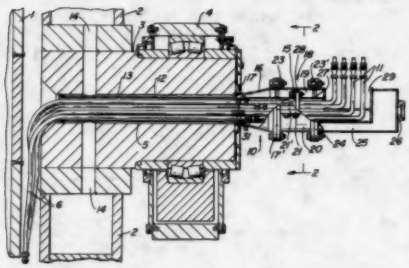
1. In a tiltable metallurgical converter having a hollow trunnion pin, a coupling assembly to convert fluid supply

conduits to fluid distribution conduits locates within such hollow trunnion pin, said coupling assembly comprising:

(a) an outer water jacket member having a flanged tubular extension on one end,

(b) an inner water jacket member flanged at both ends and secured to said trunnion pin,

(c) a tubular sleeve member flanged at one end and spaced within said inner water jacket member and said hollow trunnion pin,



(d) a water jacket spacer member flanged at both ends and secured to said inner water jacket member and said outer water jacket member, said water jacket spacer member split longitudinally into two flanged sections secured to each other, and

(e) a plurality of individual eccentric flexible fluid conduits within said tubular sleeve member.

4,679,775

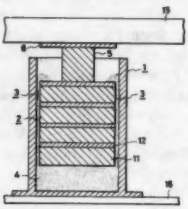
VIBRATION DAMPING EQUIPMENT

Takashi Funaki, Tokyo, and Katsuto Nakatsuka, Sendai, both of Japan, assignors to Yakumo Industrial Corporation, Tokyo, Japan, a part interest

Filed Sep. 20, 1984, Ser. No. 652,633

Int. Cl.[4] F16F *9/04*

U.S. Cl. 267—64.27 **17 Claims**



1. A vibration damping apparatus for damping vibration between a first member and a second member, comprising:

a cylinder for connection to the first member, having a closed end having a closed end surface, an open end opposite said closed end surface, and an internal surface extending in a longitudinal direction from said open end to said closed end surface;

a piston, longitudinally movable in said cylinder in spaced noncontacting relation thereto, having a side surface opposing said internal surface and an inner end surface opposite said closed end surface, and defining a continuous space completely surrounding said piston, and a piston rod connected to said piston and extending through said open end in spaced noncontacting relation to said cylinder, for connection to a second member; and

a magnetic fluid filling said space in contact with said internal surface, said side surface, said closed end surface, and said inner end surface;

one of said cylinder and said piston comprising a magnetic member and the other of said cylinder and said piston comprising a nonmagnetic member, said magnetic member including a plurality of magnetic bodies arranged so as to define means for forming a magnetic field in said cylinder of maximum intensity opposite the one of said side surface and said internal surface of said one of said cylinder and said piston and so as to thereby generate an apparent increase in the viscosity of said magnetic fluid proportionally to the magnetic field intensity therein, such that longitudinal movement of said piston in said cylinder displaces said magnetic fluid therein so as to force said magnetic fluid to flow longitudinally through the portion of said space between said side surface and said internal surface at a velocity gradient relative to said magnetic member resisted by a viscous force proportional to an average velocity of said magnetic fluid relative to said magnetic member defined by said velocity gradient, and such that said magnetic fluid resists movement of said piston perpendicular to said longitudinal direction sufficently to maintain said cylinder and said piston in said spaced noncontacting relation.

4,679,776

ELASTIC RUBBER BEARING WITH HYDRAULIC DAMPING

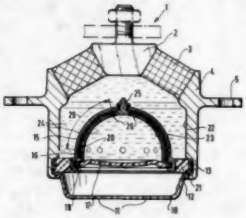
Jochen Remmel, and Robert Büchinger, both of Remscheid, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,452

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418123

Int. Cl.[4] F16F *15/04*; F16M *13/00*; B60G *15/04*

U.S. Cl. 267—140.1 **6 Claims**



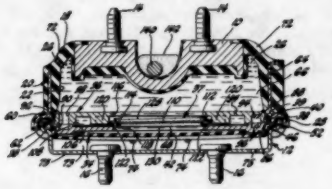
1. In an elastic rubber bearing with integrated hydraulic damping, including a bearing core, a ring-shaped spring element, and a base plate enclosing a work chamber filled with hydraulic liquid; a liquid-filled volumetrically-variable expansion chamber, a separating wall constituted of an elastic material having at least one opening therein, and a superimposed rigid separating support wall having cutouts extending intermediate said chambers; the improvement comprising: the separating wall constituted of elastic material forming an elastic membrane and said rigid separating support wall being generally hemispherical shaped, a flow throttling arrangement between the elastic membrane and the rigid separating support wall, said flow throttling arrangement including elongate passageways between said elastic membrane and said rigid separating wall communicating between said at least one opening in the elastic material and cutouts on the rigid separating wall to provide throttled flow opening means between said work chamber and expansion chamber, the elastic and the rigid separating support wall extending into the work chamber, and elastic ring means for elastically fastening said separating wall to a housing.

4,679,777

HYDRAULIC-ELASTOMERIC MOUNT DISPLACEMENT DECOUPLER

Thomas P. Gold, Westchester, Ohio, and John E. Vogel, Ann Arbor, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1985, Ser. No. 785,245
Int. Cl.[4] F16F 9/34
U.S. Cl. 267—140.1 4 Claims



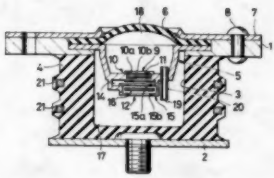
1. A hydraulic-elastomeric mount comprising a pair of mounting members, a hollow elastomeric body interconnecting said mounting members, an elastomeric diaphragm closing said elastomeric body and forming therewith a closed cavity that is filled with liquid, a rigid partition dividing said cavity into a chamber enclosed by said elastomeric body and a chamber enclosed by said diaphragm, an orifice connecting said chambers to effect damping, and a rigid nondeformable hydraulic damping decoupler mounted for free reciprocal movement between oppositely facing rigid sides in said partition in response to alternating pressure buildup in said chambers so as to effect cyclic volume change in said chambers without deformation of said decoupler to thereby permit vibratory amplitudes below a prescribed level without forcing liquid through said orifice and thus without hydraulic damping thereby, characterized by tapered elastomeric cushion means on said decoupler for both cushioning and forcibly causing rocking of said decoupler against said partition as said decoupler reciprocates between said partition sides to prevent noise generation thereby.

4,679,778

FLUID-CONTAINING POWER UNIT MOUNTING DEVICE

Toshikazu Tabata, Sagamihara; Yoshinari Fujiwara, Yachiyo; Norio Yoda, Yotsukaido, and Hiroshi Aikawa, Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa and Kinugawa Rubber Ind. Co. Ltd., Chiba, both of, Japan

Continuation of Ser. No. 696,386, Jan. 30, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 919,624
Claims priority, application Japan, Jan. 30, 1984, 59-13414
Int. Cl.[4] F16M 5/00; B60G 15/04; G05D 11/00; F16K 51/00
U.S. Cl. 267—140.1 6 Claims



1. A fluid-containing power unit mounting device comprising:
- a first base plate for attachment to a power unit;
- a second base plate for attachment to a chassis;
- a mounting rubber interposed between said first and second base plates to form an internal chamber therein;
- a diaphragm and a partition plate means, each having a perimeter, provided on one of said first and second base plates to form a secondary chamber therebetween wherein said internal and secondary chambers are partitioned by said partition plate means;
- first and second serially connected valve means each for restricting communication in at least two directions between the internal and secondary chambers and for reducing a total spring constant of the mounting device provided on the partition plate means, each of said first and second valve means having a compartment disposed in the partition plate means and a movable plate freely movable within the compartment, said partition plate means having orifices for communicating the internal chamber with the secondary chamber through the compartment of each of the first and second valve means; and
- a fluid channel means communicating the internal chamber with the secondary chamber to reduce high frequency vibration of the mounting device, said chambers and said channel being filled with a working fluid.

4. A fluid-containing power unit mounting device comprising:
- a first base plate for attachment to a power unit;
- a second base plate for attachment to a chassis;
- a mounting rubber interposed between said first and second base plate to form an internal chamber therein;
- a diaphragm and a partition plate means provided on one of said first and second base plates to form a secondary chamber therebetween wherein said internal and secondary chambers are partitioned by said partition plate means;
- first and second serially connected valve means each of restricting communication in at least two directions between the internal and secondary chambers and for reducing a total spring constant of the mounting device provided on the partition plate means, said first and second valve means respectively having plate members connected to the partition plate means through elastic members for absorbing the vibration of the mounting device, said plate members forming therebetween a central chamber filled with a working liquid; and
- orifice means disposed in the partition plate means to communicate the internal and secondary chambers with each other.

4,679,779

HYDRAULIC MOUNT

Joseph W. Hodonsky, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1986, Ser. No. 875,187
Int. Cl.[4] F16F 9/22
U.S. Cl. 267—140.1 4 Claims

1. A hydraulic mount comprising a shell, a pair of mounting members extending into the interior of said shell from opposite directions, elastomeric means joining said mounting members to the interior of said shell and defining a first chamber that expands and contracts with relative reciprocal movement of said mounting members, expansible means within said first chamber defining a second chamber that expands and contracts with relative reciprocal movement of said mounting members

in unison with and at a faster rate than said first chamber, liquid filling said chambers, first variable size orifice means for connecting said first chamber to said second chamber with an orifice that decreases in size with increasing pressure differential between said chambers above a prescribed pressure range when the pressure in said first chamber is greater, and second variable size orifice means for connecting said second chamber to said first chamber with an orifice that decreases in size with increasing pressure differential between said chambers above said prescribed pressure range when the pressure in said second chamber is greater.

4,679,780

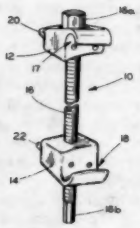
SPRING COMPRESSOR WITH LATCHABLE LOCKING DEVICE

Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Continuation-in-part of Ser. No. 565,137, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 473,720, Mar. 16, 1983, abandoned, which is a continuation of Ser. No. 242,283, Mar. 10, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 646,622

Int. Cl.⁴ F16F *1/10*

U.S. Cl. 267—177 **3 Claims**



1. A spring compressor for compressing a helical coil spring comprising:

a pair of spaced apart shoes each having a groove formed therein for receiving a portion of the helical coil of the spring;

at least one of said shoes having said groove formed of a helical configuration, and said groove defining a spring engaging bottom wall located in a plane formed at a predetermined, non-perpendicular angle with respect to a compression axis;

an elongate threaded shank parallel to said compression axis for mounting said shoes in spaced apart relationship with said grooves in facing relationship to one another, said shank having one end thereof rotatably supported by one of said shoes and having an opposite threaded end for threaded engagement with the other one of said shoes whereby rotation of said shank in one direction relative to said other one of said shoes causes said pair of spaced apart shoes to move toward one another; and

a latchable locking means carried by at least one of said shoes, said locking means including a U-shaped member having a pair of spaced apart, generally parallel legs extending through apertures formed in said shoe on opposite sides of said elongate shank, said legs having first ends connected by a connecting member and having second ends adapted to extend over said groove, said legs being located in a plane substantially parallel to said angled spring engaging bottom wall such that each of said second ends is spaced from said bottom wall by substantially the same distance, said U-shaped member being movable between a retracted position wherein said outer ends of said legs are positioned within said shoe and said portion of the helical coil spring can be inserted into said groove and a locked position wherein said second ends of said legs extend over said groove and over said portion of the helical coil, said groove and said legs cooperating to substantially surround said portion of the helical coil for maintaining said portion of the helical coil within said groove, and detent means carried by one of said shoes and positioned to engage one of said legs for maintaining said U-shaped member in either the locked position or the retracted position.

4,679,781

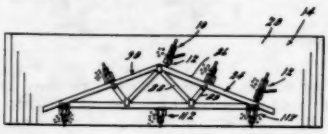
ADJUSTABLE JIG

Robert A. LePoire, 2200 Barritt, Lansing, Mich. 48912

Division of Ser. No. 507,300, Jun. 24, 1983, Pat. No. 4,524,960, which is a continuation-in-part of Ser. No. 245,970, Mar. 20, 1981, abandoned. This application Feb. 25, 1985, Ser. No. 705,318

Int. Cl.⁴ B25B *1/10*

U.S. Cl. 269—45 **3 Claims**



1. An adjustable jig for use with a support formed of magnetic material and defining a plurality of spaced passageways opening upon a surface of said support, said adjustable jig comprising, in combination, a body, a permanent magnet carried by said body and magnetically attractable to said support, pin means carried by said body and adapted to be received selectively in the passageways defined by said support to mechanically connect said body to said support, said jig including a stop member pivotally connected to said body and having a curved abutment surface adapted to engage a workpiece.

4,679,782

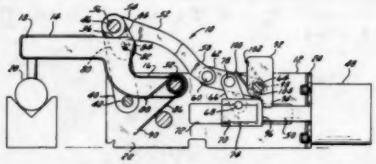
MECHANICAL TOGGLE CLAMP WITH MEANS FOR APPLYING UNIFORM CLAMPING FORCE

Edward R. Horn, Nashotah, and Norbert J. Kot, II, Milwaukee, both of Wis., assignors to Aladdin Engineering & Mfg, Brookfield, Wis.

Continuation of Ser. No. 688,314, Jan. 2, 1985, abandoned. This application Nov. 27, 1985, Ser. No. 802,306

Int. Cl.⁴ B25B *1/14*

U.S. Cl. 269—228 **19 Claims**



1. A mechanical clamp for use in clampingly engaging a workpiece, the mechanical clamp comprising:

a frame,

a clamp member having an end portion supported for movement toward and away from a supporting surface and adapted to clampingly engage a workpiece against the supporting surface, said clamp member including a cam surface,

means for pivotally connecting said clamp member to the frame such that the clamp member is pivotally movable between a clamping position wherein said end portion of the clamp member clampingly engages the workpiece

against the supporting surface and a retracted position wherein said end portion releases the workpiece, and

means for forcing said end portion of said clamp member into clamping engagement with the workpiece, said means for forcing including a force applying member engageable with said cam surface, said cam surface having opposite ends and a configuration such that said end portion of said clamp member is spaced from the supporting surface by a first dimension when the force applying member engages said one of said opposite ends of said cam surface and said end portion of said clamp member is spaced from the supporting surface by a second dimension when the force applying member engages the other of the opposite ends of said cam surface and such that the force applied by said end portion on said workpiece when said force applying member engages one of said opposite ends of said cam surface is substantially equal to the force applied by said end portion on said workpiece when said force applying member engages the other of said opposite ends of said cam surface.

4,679,783

APPARATUS FOR OPENING SIGNATURES TO BE SUPPLIED TO BINDING MACHINES

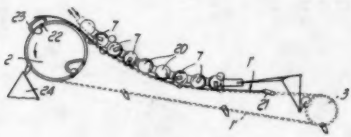
Antonio Masuri, Via G. Mameli, 11, 20129 Milano, Italy

Filed Jun. 23, 1986, Ser. No. 877,299

Claims priority, application Italy, Jul. 26, 1985, 21726 A/85

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 **9 Claims**



1. Apparatus for opening signatures comprising:

a closed loop conveyor means, said closed loop conveyor means having a concavely curved section,

means for depositing signatures to be opened onto said concavely curved section of said closed loop conveyor means in use of said apparatus,

a plurality of rotatable sucker members disposed above said concave curved section of said closed loop conveyor means,

a support frame carrying said plurality of rotatable sucker members, and

drive means connected to said support frame, said drive means operating to cause said support frame to perform reciprocating arcuate movements which follow the curve of said concave section of said closed loop conveyor means.

4,679,784

FABRIC PICKUP DEVICE

Itzchak Porat; Percy Grosberg, and Magid N. Moghaddassi, all of Leeds, England, assignors to Univ. of Leeds Industrial Services Limited, Leeds, England

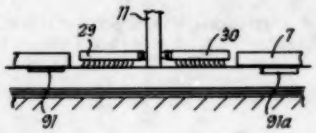
Filed Jun. 6, 1985, Ser. No. 742,217

Claims priority, application United Kingdom, Jun. 8, 1984, 8414636

Int. Cl.[4] B65H *3/22*

U.S. Cl. 271—18.3 **10 Claims**

1. A fabric pickup device comprising a carrier; two pickup plated lying one to each side of the carrier, each pickup plate having a lower surface with an inner edge adjacent to the carrier and an outer edge; means mounting each plate on the carrier adjacent to the inner edge of the respective plate for pivotal movement of the plates in opposite senses about parallel. substantially horizontal axes; a plurality of needles carried on the lower surface of each plate; the tips of all the needles on a plate being substantially parallel. lying at an acute angle to the lower surface of the respective plate and pointing towards the outer edge of the respective plate, and the points of all the needles on a plate being substantially coplanar and adapted to engage a fabric layer; a nozzle located on the carrier between the two plates for directing an air blast downwardly between the plates; and means for povoting the plates between a



standby position wherein the tips of the needles on one plate lie at a downwardly acute angle to the tips of the needles on the other plate and below the level of the nozzle, a fabric pickup position wherein the plates are pivoted upwardly from the standby position while in engagement with the fabric layer, said downwardly acute angle is increased and the needle points on both plates lie not below the level of the nozzle and tension the fabric layer acrosss the nozzle, and a release position wherein the tips of the needles on each plate lie substantially vertically and below the level of the nozzle.

4,679,785

PROCESS AND INSTALLATION FOR TRANSFER AND POSITIONING

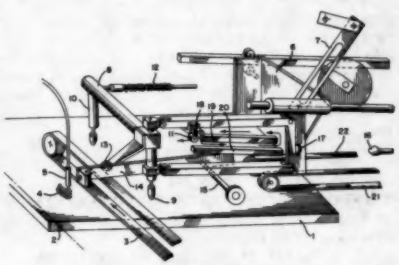
Bernard Helffer, St Andres les Vergers, and Jacques Scheydecker, Avallon, both of France, assignors to Institut Textile de France, Boulogne Billancourt, France

Filed Apr. 20, 1984, Ser. No. 602,398

Claims priority, application France, May 4, 1983, 83 07461

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—227 **14 Claims**



1. A system for the transferring and positioning of a workpiece upon movement thereof from a first station to a second station, said system comprising a vertically adjustable surface having first and second locations thereon, first transfer means for slidably introducing a workpiece onto said surface at said first location, repositioning means overlying said surface for selective engagement with a workpiece at said first location and a transfer and repositioning of the workpiece to the second location, and second transfer means for engaging said workpiece at said second location and slidably removing the workpiece from said surface toward the second station, said repositioning means including vertically adjustable elements, means responsive to the presence of a workpiece at the first surface location for effecting a downward movement of said elements

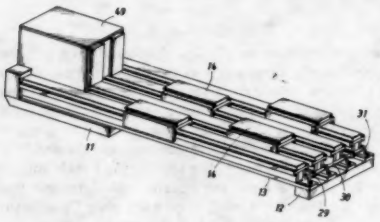
against the workpiece and the underlying surface, support means for said surface responsive to engagement of said elements against a workpiece and underlying surface to allow a vertical downward movement of said surface and a downward retraction thereof from the first transfer means, means for laterally shifting said elements, means for rotating said elements during a lateral shifting thereof, and means, at the second surface location, for retracting said elements, allowing a vertically upward return of said surface and an engagement of a repositioned workpiece with said second transfer means remote from said first location and said first transfer means.

4,679,786

UNIVERSAL EXERCISE MACHINE

Robert E. Rodgers, 8011 Meadow Croft, Houston, Tex. 77063

Filed Feb. 25, 1986, Ser. No. 832,640
Int. Cl.[4] A63B *21/00, 1/00*
U.S. Cl. 272—70 **18 Claims**



8. An exercise apparatus comprising:
(a) a supportive frame;
(b) a pair of slides mounted on said frame for reciprocating motion driven by the user during limb exercise on the exercise apparatus;
(c) endless chain means deployed in loops;
(d) said slides including selectively releasable chain connector means for connecting to said endless chain means to provide a power stroke in a first direction;
(e) said slides being deployed on said frame to be powered by the user in providing reciprocating motion thereto;
(f) rotative power consuming means; and
(g) first means connecting said endless chain means to said power consuming means for delivery of rotation thereto to deliver power to be consumed in the operation of the apparatus to thereby provide a load to the user, wherein said first means includes means powered by said endless chain means on power strokes provided by the user thereto and enabling reciprocation of said endless chain means.

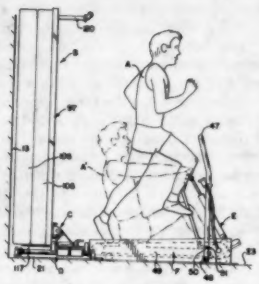
4,679,787

COMBINED EXERCISE STATION AND SLEEPING BED

Joseph D. Guilbault, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Feb. 14, 1985, Ser. No. 701,618
Int. Cl.[4] A63B *21/00*; A47C *19/06*
U.S. Cl. 272—93 **10 Claims**

1. A combined bed and exercise apparatus comprising, in combination:
a frame means adapted to be firmly fixed in place to a floor;
a bed having a head portion, a foot portion, two side edges and an upper surface;
a hinge fixed to said frame means and pivotally supporting one end of said bed above said frame means such that said bed is pivotable between a vertical position and a horizontal position, said bed being positioned over a bed space in said horizontal position; and,
excercise equipment immovably fixed in place on said frame means and immovably secured on said floor within said bed space and collapsible for accommodation and concealment thereof beneath said bed when in its horizontal position, said exercise equipment being exposed in its fixed



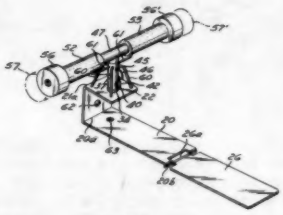
position on the said fixed frame means, when said bed is in said vertical position, to thereby enable normal usage of the so exposed said exercise equipment.

4,679,788

EXERCISE DEVICE

David M. Adler, 1301 N.E. 191 St., North Miami Beach, Fla. 33141

Filed Dec. 2, 1985, Ser. No. 803,420
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—93 **16 Claims**



1. An exercise device comprising:
a substantially rigid base having
an elongated flat bottom segment adapted to extend beneath a bed mattress,
a front segment attached to and extending transverse to said bottom segment at one end thereof,
and a top segment attached to said front segment in spaced relation to said bottom segment and extending from said front segment substantially parallel to said bottom segment,
said bottom, front and top segments together forming a channel-shaped structure dimensioned to fit snugly on the end of a bed mattress;
a post structure extending transverse to said top segment of the base in a direction away from said bottom segment of the base; and
a cross arm structure coupled to said post structure in spaced relation to said top segment of the base, said cross arm structure extending substantially parallel to said top segment of the base and substantially parallel to said front segment of the base and spaced from said top segment enough to permit a user's legs adjacent the ankles to fit between said cross arm structure and said top segment;
said base also having a flat back segment hingedly connected to said bottom segment at the opposite end of the latter from said front segment.

4,679,789

VIDEO GAME APPARATUS WITH AUTOMATIC SKILL LEVEL ADJUSTMENT

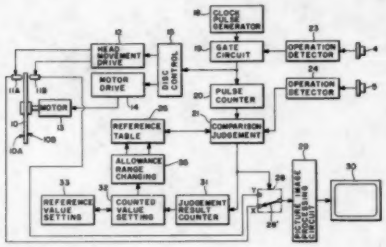
Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Continuation of Ser. No. 686,483, Dec. 26, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,897

Claims priority, application Japan, Dec. 26, 1983, 58-198413[U]; Dec. 26, 1983, 58-198414[U]

Int. Cl.[4] A63F 9/22

U.S. Cl. 273—1 E **6 Claims**



1. In a video game apparatus of the type in which a player actuates an operation section while looking at a game picture image displayed and a success or failure of the game is determined by an operating timing of the operation section; the improvement comprising:

a reference table for setting a permissible range of said operating timing indicative of the success of the game;

timing detection means for detecting a timing of the operation section operated by a player, said timing detection means comprising a clock pulse generator and a pulse counter for counting the number of pulses generated by said generator;

judgment means for emitting a first type of signal when the timing detected by said timing detection means is within the permissible range set by said reference table, and emitting a second type of signal when the timing detected by said timing detection means is outside the permissible range set by said reference table;

judgment result counting means for counting at least one of said first and second types of signals output from said judgment means;

counted value detection means for outputting an adjustment signal when it is detected that the counted value in said judgment result counting means has reached a preset value; and

permissible range changing means for changing the permissible range set in said reference table in accordance with said adjustment signal.

4,679,790

BASEBALL EXERCISING DEVICE

Yong S. Ham, Jangmi APT 12-1105, 7-Shinchun-Dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Mar. 12, 1986, Ser. No. 838,829

Int. Cl.[4] A63B 69/40

U.S. Cl. 273—26 E **11 Claims**

1. A portable baseball hitting device comprising

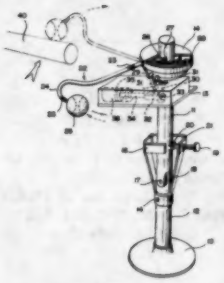
a column member adapted to extend in a substantially vertical direction,

a housing rotatably disposed at one end of said column member,

an arm member connected at one end to said housing to rotate therewith, said housing being provided at the surface thereof with a pin, said arm member extending radially from said housing in a substantially horizontal direction with the other end thereof being attached to a baseball,

a hydraulic cylinder mounted on the column member, said hydraulic cylinder being provided with a means for engaging said pin to retard the initial counter-clockwise rotation of the housing and arm member attached thereto,

spring bias means disposed within said housing with one end



thereof connected to the housing and the other end thereof connected to the column member whereby when a batter hits the ball, the arm member is caused to rotate in a clockwise direction around said column member, against the bias of the spring means and when the arm member stops its clockwise rotation, the spring means causes the arm member to rotate counter-clockwise to return to its initial hitting position.

4,679,791

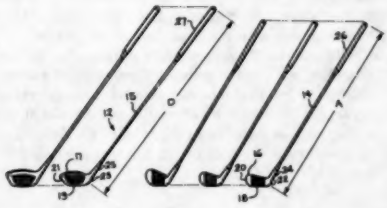
SET OF GOLF CLUBS

Donald R. Hull, 501½ Hickory St., Perrysburg, Ohio 43551

Filed Nov. 29, 1984, Ser. No. 676,517

Int. Cl.[4] A63B 53/00

U.S. Cl. 273—77 A **10 Claims**



10. An improved set of golf clubs including a plurality of irons and a plurality of woods, each of said clubs including a shaft having a first and second end, a grip positioned about said first end of said shaft, a club head attached to said second end of said shaft by a hosel, said club head having a toe, a heel, and a striking face, said grip having a substantially rectangular cross-section with opposed flat parallel sides and a rounded top and bottom, said sides being substantially parallel to the leading edge of the club head and the score lines on the striking face of said club head, said grip being constructed of a substantially non-compressible core covered by a wear-resistant compressible outer cover, said irons having a first common club length, first common club weight and first common club lie, said woods having a second common club length, a second common club weight and a second common club lie, said second common club length of said woods being longer than said first common club length of said irons, said second common club weight of said woods being lighter than said first

common club weight of said irons, said second common club lie of said woods being flatter than said first common club lie of said irons, one-half of said first and second common club weights lying in said toe of said club heads and the remaining one-half of said club weights lying in said grip, shaft, hosel and heel of said clubs, whereby the center of gravity of said clubs lie at the approximate center of said club faces.

4,679,792

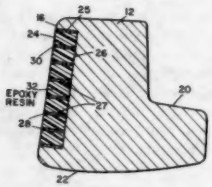
GOLF PUTTER

George T. Straza, and George C. P. Straza, both of P.O. Box 1292, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 632,373, Jul. 19, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,166

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—78 **11 Claims**



11. An insert member for forming the ball striking face of a golf putter head, the member comprising:

a cellular structure having an outer periphery of the same general shape as the elongate outer periphery of a golf putter head, a generally flat front face, and a thickness substantially less than the thickness of a putter head, for mounting in a correspondingly shaped cavity in the front face of a golf putter head with the front face of the structure coplanar with the front face of the putter head;

the cellular structure comprising a honeycomb-like array of adjoining open ended cells with their central axes perpendicular to the front face of the array, adjacent cells being separated by common cell walls, and a resilient material filling each of the cells to the level of the front face so as to leave the outer ends of the cell walls exposed.

4,679,793

TABLE GAME

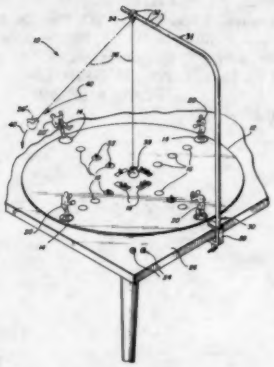
Ramon Gonzalez, 2721 W. Wellington, Chicago, Ill. 60618

Filed Mar. 10, 1986, Ser. No. 838,308

Int. Cl.[4] A63F *7/24*

U.S. Cl. 273—85 R **4 Claims**

1. a table game for simulating the sport of boxing, or the like, including a horizontal playing surface adapted to be placed on a table, an overhead support means attachable to said table and having a horizontal beam member in substantial overlaying relationship to said playing surface, a pendulum dependent from said horizontal beam, means for centering said pendulum above said playing surface wherein said centering means comprises a plurality of notches defined in said beam with said pendulum suspended from a ring encircling said beam and placable in any of said notches, a plurality of playing fugures positionable on said playing surface to be vulnerable to said



pendulum when said pendulum is swung in a circular motion above said playing surface.

4,679,794

GOLF BALL

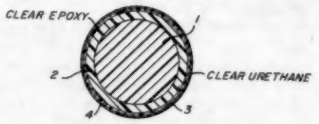
Mikio Yamada, Kobe, and Akihiko Hamada, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Nov. 5, 1985, Ser. No. 795,129

Claims priority, application Japan, Nov. 5, 1984, 59-233498

Int. Cl.[4] A63B *37/12, 43/06*

U.S. Cl. 273—235 R **7 Claims**



1. A golf ball having an excellent white appearance without any white paint layers disposed on the cover, which comprises a core with a cover thereon, said cover containing 100 parts by weight of an ionomer resin, 1 to 10 parts by weight of an inorganic white pigment containing barium sulfate having a particle size of 1 to 10 micrometers said barium sulfate being present in an amount of not less than 60% by weight, based on the total amount of the inorganic white pigment, 0.0001 to 0.05 parts by weight of a blue coloring agent and 0.01 to 0.4 parts by weight of a fluorescent whitening agent, the weight of said blue coloring agent and said fluorescent whitening agent being based on 100 parts by weight of the ionomer resin.

4,679,795

OPTICAL BRIGHTENERS IN GOLF BALL COVERS

Terence Melvin, Somers, Conn., and R. Dennis Nesbitt, Westfield, Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 519,351, Aug. 1, 1983, abandoned. This application Apr. 18, 1986, Ser. No. 861,532

Int. Cl.[4] A63B *37/00, 37/12*

U.S. Cl. 273—235 R **28 Claims**

1. A golf ball which incorporates a polymeric material which contains from about one percent 1% to about ten percent 10% of a white pigment wherein said pigmented poly-

meric material incorporates from about 0.01 to about 0.50 percent of a compatible optical brightener which increases the whiteness of the surface of said golf ball all percentages to total 100 percent.

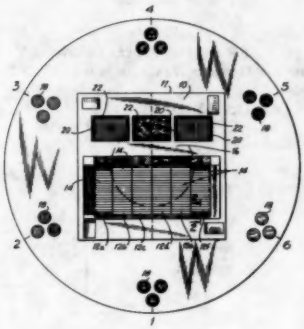
5. A golf ball having a core and a cover wherein said cover comprises from about 99 to about 89.50 percent of a natural or synthetic polymer, from about one to about ten percent of a white pigment and from about 0.05 to about 0.25 percent of a compatible optical brightener which increases the whiteness of the cover all percentages to total 100 percent.

4,679,796

PROBLEM SOLVING GAME

Harold Rein, 33 Fifth Ave., New York, N.Y. 10003, assignor to Harold Rein et al, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,855
Int. Cl.[4] A63F 3/00; A63B 71/00
U.S. Cl. 273—236 **5 Claims**



1. A game in which players gain points by correctly solving problems, the game comprising:

scoring means comprising:

a plurality of vertical columns, each vertical column being defined by a plurality of slots;

a plurality of chips, each chip shaped and dimensioned to removably fit into said slots; and

a plurality of challenge cards, each challenge card having a problem to be solved by a player and the correct solution to the problem thereon, players gaining points by correctly solving the problem, said points being indicated during play by chips retained in slots, wherein each vertical column is divided into three areas and wherein the challenge cards are divided into three sets, each set of challenge cards being associated with a different one of said three column areas, the first challenge card set including cards with easier to solve problems thereon, the second set including cards with problems more difficult to solve than those on the first set, and the third set including cards with problems more difficult to solve than those on the second set.

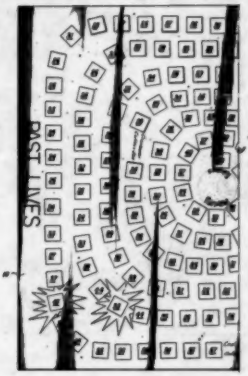
4,679,797

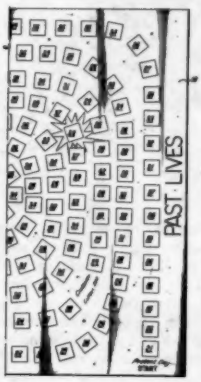
BOARD GAME SIMULATING TRAVEL THROUGH TIME

Alan Sherin, 12330 Osborne St., #28, Hanson Hills, Calif. 91331; Bradley Geagley, 1411 N. Hayworth, #18, West Hollywood, Calif. 90039, and Glenn Benest, 953 11th St., #1, Santa Monica, Calif. 90403

Filed Jul. 22, 1985, Ser. No. 757,152
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—251 **4 Claims**

1. A game board combination including: a game board having marked squares thereon constituting a path from a beginning location to an end location and simulating a journey backward in time through a number of distinct past ages, each of the past ages comprising a plurality of successive squares respectively containing directions to the players to be followed as a player's game piece lands on a particular square; a plurality of treasure cards for each of the different ages, with at least one of the squares on the game board in each of the different ages directing a player to select a treasure card for the corresponding age; a plurality of instruction cards for each of the different





ages and wherein at least one square on the game board for each of the different ages directs a player to select one of the instruction cards in that particular age each player accumulating points, as different treasure cards are selected; and a book containing descriptions of past lives indexed to different point totals so that a player may determine his past life as indicated to the total number of points accumulated when the game ends.

4,679,798

BOARD GAME APPARATUS REPRESENTING TRANSPORTATION

Robert E. Dvorak, 7021 Date Palm Ave., S., St. Petersburg, Fla. 33707, and Frank D. Fattedad, 302-5411 Arcadia Road, Richmond, B.C., Canada (V6X 2H1)

Filed Mar. 15, 1985, Ser. No. 712,359
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—254 **12 Claims**

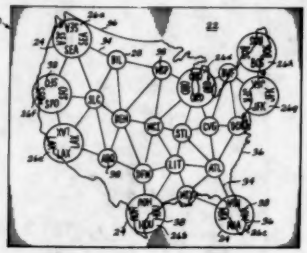
3. A game apparatus comprising in combination:

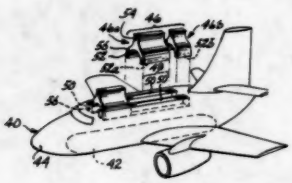
(a) a game board with a playing surface displaying a plurality of interconnected first symbols representing destinations, the first symbols being distinguishable by coded first indicia displayed thereon;

(b) second symbols representing destinations displayed on the playing surface, said second symbols not displaying any of the first indicia;

(c) third symbols representing transportation routes located and displayed on the playing surface so as to extend between and connect various of the first and second symbols;

(d) a plurality of distinguishable first playing pieces that do not display any of the first indicia, each first playing piece having upper and lower surfaces, the lower surfaces of each first playing piece being adapted for placement on the playing surface at selected first symbols, the upper





surface of each playing piece being adapted for selectively receiving and carrying at least one second playing piece;

(e) a plurality of second playing pieces of at least one size, each second playing piece being adapted to be received and carried by any one of the first playing pieces, with each second playing piece correspondingly displaying at least a portion of one of the first indicia; and,

(f) said first playing pieces having the configuration to transport vehicles that correspond with the nature of the destinations represented by the first and second symbols and with the transportation routes represented by the third symbols.

4,679,799

APPARATUS AND METHOD FOR PROPELLING AN OBJECT

Don A. Coletti, P.O. Box 171, Troy, N.Y. 12182

Filed Aug. 30, 1985, Ser. No. 771,347

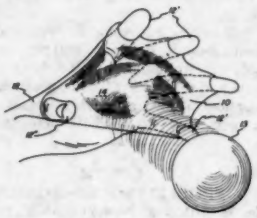
Int. Cl.[4] A63B *67/00*

U.S. Cl. 273—318 **10 Claims**

1. A game apparatus comprising:

a flaccid, essentially planar base having finite bounds of predetermined dimension, within said bounds the surface of said base being homogeneous; and

at least three attachment means, each attachment means located toward the periphery of the base a predetermined distance from each other, each of said attachment means being adapted to secure a portion of the base to a human finger, and support the base in a spaced apart relationship to the palm of the hand when the fingers are moved away from each other, whereby the contraction of the fingers and the associated attachment means toward each other move the base to a relaxed state wherein said base forms a pocket for holding an object, and the expansion of the



fingers and associated attachment means away from each other, moves the base to its taut position wherein said base is substantially planar.

4,679,800

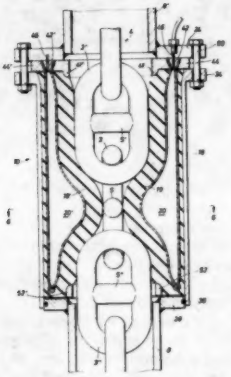
HAWSER CHAIN SEAL ASSEMBLY

James A. Burton, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Oct. 15, 1984, Ser. No. 660,710

Int. Cl.[4] B63B *21/18;* **F16J** *15/00*

U.S. Cl. 277—34 **7 Claims**



1. A hawser chain seal assembly adapted for sealing about a hawser chain, said chain extending through two axially aligned sections of hawser pipe, said assembly comprising,

a housing means adapted for connecting said hawser pipe sections, said housing means movable to and from an open position for exposing said hawser chain extending through said hawser pipe sections and a closed position for longitudinally surrounding said hawser chain,

a sealing element having at least two semi-cylindrical parts, each of said parts adapted for placement partially about said hawser chain when said housing means is in said open position, said sealing element being longitudinally disposed between said hawser chain and said housing means when said housing means is in said closed position,

said semi-cylindrical parts of said sealing element each having at least one inflatable bladder,

means for receiving pressurized fluid for application to said bladders of said sealing elements for causing said sealing elements to sealingly engage said hawser chain, and

said housing means is connected between ends of the two axially aligned sections of hawser pipe and comprises,

a first outward flange fastened to an end of a first section of hawser pipe,

a second outward flange fastened to an end of a second section of hawser pipe,

a sealing means disposed peripherally about an outwardly facing surface of said second flange, and

a cylindrical housing structure for sealingly engaging said sealing means of said second flange and for fastening to said first outward flange, said housing structure being movable in one direction to an open position for providing external access to said hawser chain and being movable in the other direction to a closed position for fastening to said first outward flange.

4. A hawser chain seal assembly adapted for sealing about a hawser chain, said chain extending through two axially aligned sections of hawser pipe, said assembly comprising,

a housing means adapted for connecting said hawser pipe sections, said housing means movable to and from an open position for exposing said hawser chain extending through said hawser pipe sections and a closed position for longitudinally surrounding said hawser chain,

a sealing element having at least two semi-cylindrical parts, each of said parts adapted for placement partially about said hawser chain when said housing means is in said open position, said sealing element being longitudinally disposed between said hawser chain and said housing means when said housing means is in said closed position,

said semi-cylindrical parts of said sealing element each having a plurality of inflatable bladders molded therein,

means for receiving pressurized fluid for application to said bladders of said sealing elements for causing said sealing elements to sealingly engage said hawser chain,

said semi-cylindrical sealing parts are each formed of elastomeric material in the shape of one-half of a cylinder cut by a plane through its longitudinal axis and when placed about said hawser chain cooperate to form a cylindrical packing element for sealing about said hawser chain

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4,679,801

LABYRINTH SEAL WITH PRESSURIZED SEALING PACKING

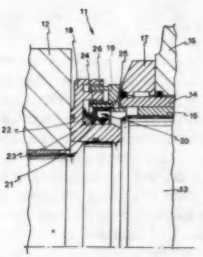
Alfredo Poloni, Ronchi Del Legionari, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Feb. 28, 1986, Ser. No. 834,598

Claims priority, application Italy, Feb. 28, 1985, 83334 A/85

Int. Cl.[4] F16J *15/32, 15/447*

U.S. Cl. 277—53 **4 Claims**



1. A labyrinth seal for providing a seal between elements in relative motion, comprising:

a stationary collar

rotary collar

a labyrinth defined by said stationary collar and said rotary collar;

a sealing packing of a flexible material located in the innermost portion of said labyrinth and facing said labyrinth, said sealing packing comprising at least one inner lip and at least one frontal lip, each of said lips contacting said rotary collar, said packing and said rotary collar defining a toric space, the rotary collar being rotatable with respect to the inner lip and the frontal lip; and

means to deliver fluid under pressure to a portion of the labyrinth next to said sealing packing.

4,679,802

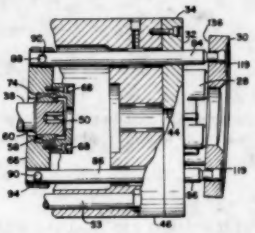
CLAMP CHUCK

Loren D. Beal, 754 Penarth Ave., Walnut, Calif. 91789

Filed Mar. 14, 1986, Ser. No. 839,736

Int. Cl.[4] B23B *31/10*

U.S. Cl. 279—106 **21 Claims**



1. A chuck assembly for retaining a workpiece in a machine tool during a machining operation including:

a tool surface;

a clamp member having a clamp surface thereon facing said tool surface, said tool and clamp surfaces being adapted for retaining a workpiece therebetween; and

means for moving said clamp surface with respect to said tool surface, said means for moving including:

a connection member adapted for connection to a source of linear movemment;

a lever member having:

a first edge portion;

a second edge portion; and

a central portion;

first pivot means connecting said central portion of said lever member to said connection member;

at least two tension members, each having:

a first end; and

a second end;

second pivot means connecting said first ends of said at least two tension members to said first and second edge portions of said lever member; and

third pivot means operatively connecting said second ends of said at least two tension members to said clamp surface.

4,679,803

APPARATUS FOR MAINTAINING STABILITY OF MOBILE LAND VEHICLES ON SLOPING TERRAIN

Cleveland J. Biller, Morgantown, and David D. Johnson, Booth, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

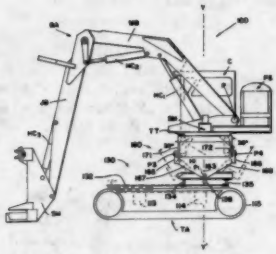
Filed Jan. 27, 1986, Ser. No. 822,574

Int. Cl.[4] B60P *1/18;* **B60G** *17/00*

U.S. Cl. 280—6 H **20 Claims**

1. In a vehicle including a base platform supporting a swing-house assembly for rotation about a first axis generally normal to said platform and a driver tread assembly for propelling said vehicle the swing-house assembly having an operator's cab, an engine and a boom assembly, and the tread assembly having longitduinal and transverse axes normal to said first axis, an apparatus disposed between said platform and said tread assembly for changing the center of gravity of said vehicle to stabilize the vehicle during its movement over terrain of varying slope said apparatus comprising:

means for translating said base platform relative to said tread assembly along said longitudinal axis, and



said translating means including means for pivoting said base platform relative to said tread assembly about said transverse axis.

4,679,804

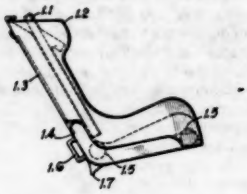
CONVERTIBLE AUTO RESTRAINER SEAT (CAR SET)

Conner Johnson, 3317-B Pepper Tree Cir., Decatur, Ga. 30034

Filed Sep. 30, 1985, Ser. No. 781,798

Int. Cl.[4] B62B *7/12*

U.S. Cl. 280—30 **8 Claims**



1. A seat for children comprising a seat portion with a a back portion extending generally vertically from one edge thereof, said seat portion having separately pivotable front and rear sets of leg members secured thereto, said members having an operative position for supporting the seat, and a folded position for storage thereof, said back portion having a recess formed in the rear face thereof with a panel releasably secured therein, said back portion also having upper and lower retaining means, said lower retaining means for holding said panel in said recess, and said upper retaining means for supporting said panel in a position above and generally parallel to said seat portion.

4,679,805

SPACE SAVER CART

Michael J. Cunningham, 6004 5th Avenue, S.E., Calgary, Alberta, Canada T2A 4E4

Filed Aug. 11, 1986, Ser. No. 895,215

Claims priority, application Canada, Sep. 17, 1985, 490910

Int. Cl.[4] B62B *3/00*

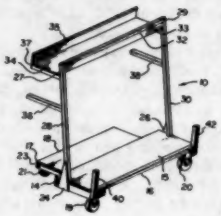
U.S. Cl. 280—33.99 R **12 Claims**

1. A movable cart comprising:

(a) a base frame provided with means for rollably moving said cart, said base frame including a longitudinally extending beam member and two deck support members, each of generally rectangular outline, attached to said beam member and extending horizontally outwardly in mutually opposed directions from the points of attachment to said beam member, the first said member being positioned at a level slightly below that of the second said member;

(b) elongated support means vertically extending from and connected to said base frame; and

(c) an open-ended rectangular tray member secured to and projecting outwardly from said vertically extending support means at its upper end, said tray member being parallel to and vertically spaced apart from said first deck support member of said base frame;



said cart being constructed and arranged such that when the first said cart is brought into juxtaposition with a second said cart the first deck support member of said base support means of said first cart will nest beneath the second deck support member of said second cart.

4,679,806

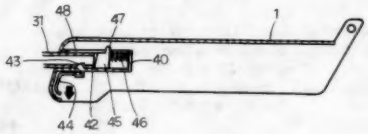
ARM REST AND HANDRAIL ASSEMBLY FOR BABY CARRIAGE

Lin Gingline, Tainan Hsien, Taiwan, assignor to Te-Chin Handicraft Enterprise Co., Ltd., Tainan Hsien, Taiwan

Filed Feb. 19, 1986, Ser. No. 830,810

Int. Cl.[4] B62B *7/14*

U.S. Cl. 280—47.38 **1 Claim**



1. An improved banister for a baby carriage comprising left-hand and right-hand side banisters and a front banister, said left-hand and right-hand side banisters having open front ends, said front banister having locking projections at its opposite ends for insertion into the open front ends of said left-hand and right-hand banisters, respectively, said locking projections each having an aperture in the underside of each such projection, each of said left-hand and right-hand banisters having in said open front ends a locking chamber for receiving such projection, a plate in each said locking chamber slidable from the front to the back of each said chamber and resilient means in each said chamber for urging said plate in each said open end to the front end thereof, a protrusion at the upper side of each said slidable plate extending in a groove in the upper wall of said chamber for receiving said slidable plate protrusion and for guiding said plate and a stopper in the bottom wall of each said chamber, said stopper having a sloping front wall, a vertical back stopping wall, a spring for urging said stopper into said chamber and a trigger for extracting said stopper from said chamber, the forward end of the protrusions on said front banister contacting the sloping front wall of said stopper to depress said stopper against the tension of said spring as said front banister protrusions are inserted, said stopper being urged upward by said spring into the aperture when said stopper and aperture are aligned, said stopper being withdrawn from said

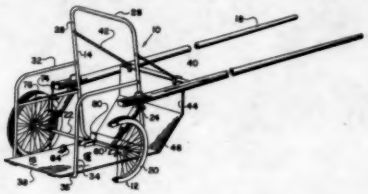
banister when said trigger is actuated, said aperture being located in an underside of said front bannister projection.

4,679,807

WHEELCHAIR CART

Johnny D. Raybon, 509 Lubbock Rd., Brownfield, Tex. 79316

Filed Aug. 14, 1986, Ser. No. 896,758
Int. Cl.[4] B62C *1/02*
U.S. Cl. 280—65 **10 Claims**



1. A sulky having:

a "U" shaped frame having a bight and two distal ends,

a stub axle, connected to each distal end of the "U" shaped frame,

a wheel journaled to each of the stub axles,

two horizontal shafts for a horse extending forward of the wheels,

WHEREIN THE IMPROVEMENT COMPRISES:

a floor having a rear and front portion,

said front portion of the floor connected to the bight of the "U" shaped frame,

a roll bar frame connected to the shafts and connected to the front portion of the floor and extending upward therefrom,

a horizontal roll bar at the top of the roll bar frame,

a horizontal handrail on each side of the sulky,

each handrail attached to and extending rearward of the roll bar,

the rear of each handrail connected to the rear of the floor, and

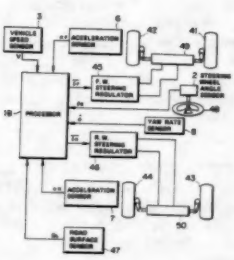
lock means on the floor for locking at least one wheelchair to the floor.

4,679,808

VEHICLE MOTION ESTIMATING SYSTEM

Ken Ito, Yokohama, and Taketoshi Kawabe, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 7, 1986, Ser. No. 837,170
Claims priority, application Japan, Mar. 15, 1985, 60-50553
Int. Cl.[4] B62D *6/00*
U.S. Cl. 280—91 **13 Claims**



1. A vehicle motion estimating system comprising:

means for sensing a steering wheel angle of a controlled vehicle, determining an actual value of said steering wheel angle, and producing a signal indicative of said steering wheel angle,

means for sensing a vehicle speed of said controlled vehicle, determining an actual value of said vehicle speed, and producing a signal indicative of said speed,

means for sensing a first motion variable of said controlled vehicle, determining an actual value of said first motion variable, and producing a signal indicative of said first motion variable,

means for sensing a second motion variable of said controlled vehicle, determining an actual value of said second motion variable, and producing a signal indicative of said second motion variable, and

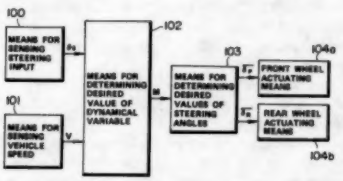
processing means, with inputs receiving the signals produced by said steering wheel angle sensing means, vehicle speed sensing means and first and second motion variable sensing means, for estimating from said signals at least a third variable defining a motion of said controlled vehicle, said processing means comprising state discriminating means for producing a condition signal which is in a first signal state when said controlled vehicle is in a steady state turning motion and in a second signal state when said controlled vehicle is in transient state turning motion, motion estimating means for determining estimated values of said first, second and third variables corresponding to the signals indicative of said actual values of said steering wheel angle and vehicle speed by solving at least a first mathematical vehicle model which is determined by equations of vehicle motion and values of a group of vehicle characterizing parameters comprising a first vehicle characterizing parameter, and parameter adjusting means for adjusting the value of said first vehicle characterizing parameter used in determining said estimated value of said third variable in accordance with a result of a comparison between said actual and estimated values of said first motion variable when said condition signal is in said first signal state, and in accordance with a result of a comparison between said actual and estimated values of said second motion variable when said condition signal is in said second signal state.

4,679,809

STEERING CONTROL SYSTEM FOR WHEELED VEHICLE

Ken Ito; Naohiko Inoue, both of Yokohama, and Taketosi Kawabe, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,650
Claims priority, application Japan, Sep. 10, 1984, 59-188153; Jan. 28, 1985, 60-13925; Jan. 31, 1985, 60-15512
Int. Cl.[4] B62D *6/02*
U.S. Cl. 280—91 **17 Claims**



1. A steering control system for a controlled vehicle having a pair of front wheels and a pair of rear wheels, comprising:

steering input sensing means for sensing a steering input quantity representing a driver's steering command of said controlled vehicle and determining a sensed value of said steering input quantity,

vehicle speed sensing means for sensing a vehicle speed of

said controlled vehicle and determining a sensed value of said vehicle speed,

target determining means connected with said steering input and vehicle speed sensing means for determining a desired value of at least one dynamic variable corresponding to a response of a desired vehicle to said sensed values of said steering input quantity and said vehicle speed by solving a group of equations of vehicle motion characteristics of said desired vehicle for said desired value of said at least one dynamic variable using a set of vehicle parameters representative of said desired vehicle,

steering angle determining means connected with said target determining means for determining desired values of front and rear steering angles of said front wheels and said rear wheels required to achieve said desired value of said dynamic variable by solving equations of motion characteristic of said controlled vehicle using said desired value of said dynamic variable and a set of vehicle parameters representative of said controlled vehicle,

front wheel steering actuating means for steering said front wheels of said controlled vehicle so that the actual front steering angle of said front wheels remains equal to said desired value of said front steering angle,

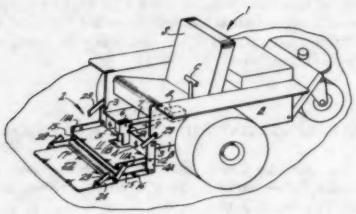
rear wheel steering actuating means for steering said rear wheels of said controlled vehicle so that the actual rear steering angle of said rear wheels remains equal to said desired value of said rear steering angle.

4,679,810

POWERED STEP ASSEMBLY FOR VEHICLES

James F. Kimball, 83617 Rattlesnake Rd., Dexter, Oreg. 97431

Filed Jun. 30, 1986, Ser. No. 879,968
Int. Cl.[4] B60R *3/02*
U.S. Cl. 280—166 **7 Claims**



1. A step assembly for a vehicle having a forwardly disposed seat, said assembly comprising,

a control plate pivotally attached to said vehicle for movement about a horizontal axis,

step means pivotally secured to said control plate and located forwardly of said vehicle seat and including a step member,

linkage means pivotally coupling said control plate to said step means,

control bars releasably attached at one of their ends to said step means and at their opposite ends to the body of said vehicle, and

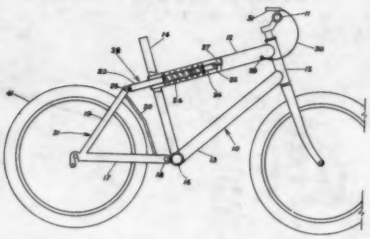
powered actuator means carried by said vehicle and coupled to said control plate for positioning said plate about said horizontal axis, wherein control plate movement by said actuator means will position said step means between a lowermost, generally horizontal ground engaging position to function as a step and an inclined elevated position for permitting said step means to function as a footrest for an occupant in said vehicle seat, and wherein said step means may be pivoted from said inclined elevated position to a generally vertical, fully elevated position after said control bars have been disconnected from said step means.

4,679,811

BICYCLE REAR SUSPENSION SYSTEM

Jerry N. Shuler, 3019 Stanford Rd., Fort Collins, Colo. 80525

Filed Jun. 26, 1986, Ser. No. 878,629
Int. Cl.[4] B62K *25/10*
U.S. Cl. 280—284 **4 Claims**



1. A rear suspension system for a bicycle, said bicycle having a main frame including a top tube, a seat tube, a bottom bracket shell, and a swing arm pivot and a rear frame assembly which includes a swing arm, a pair of seat stays, a swing arm front support and a rear wheel all pivotally mounted to said main frame at the junction of said swing arm pivot and said swing arm, comprising:

a tubular shock absorber assembly employing linear reciprocating motion mounted coaxially inside said top tube, said tubular shock absorber assembly having a front anchor point attached to said top tube and a rear anchor point extending through and beyond an open rearward end of said top tube and being pivotally connected to a junction point of said seat stays, said tubular shock absorber assembly including an inner tube having a reduced diameter portion at one end thereof, an outer tube slidably mounted about said inner tube, and a compression spring mounted around and operatively connected between said inner and outer tubes;

a means for remotely adjusting the dampening characteristics of said tubular shock absorber assembly including an elastomer cylinder slidably mounted on said reduced diameter portion, a sliding compression tube mounted on said reduced diameter portion concentric to said elastomer cylinder and a sliding piston mounted between said elastomer cylinder and said sliding compression tube, said sliding compression tube being connected to an operator actuated control lever by means of a cable such that when actuated, said control lever, through said cable, moves said sliding compression tube and said sliding piston relative to said reduced diameter portion against said elastomer cylinder, compressing said elastomer cylinder in the longitudinal direction of said tubular shock absorber assembly, the longitudinal compression of said elastomer cylinder resulting in a diametric increase of said elastomer cylinder which acts between the outer surface of the reduced diameter portion of said inner tube and an inner surface of said outer tube such that the damping characteristics of the tubular shock absorber assembly is adjusted.

4,679,812

APPARATUS FOR SIMPLIFYING THE LAUNCHING AND RETRIEVAL OF A BOAT FROM ITS TRAILER

Donn A. Byrnes, 94 High Mesa Rd., Los Lunas, N. Mex. 87031

Filed Dec. 19, 1985, Ser. No. 810,997
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—406 A **5 Claims**

1. A boat launching and retrieving apparatus comprising:

a longitudinal body adapted to serve as an intermediate coupling apparatus between a tow vehicle and a boat trailer; a winch mounted to said longitudinal body for

lowering the boat trailer down a boat ramp for launching and pulling the boat trailer up the boat ramp for retrieval; means for limiting relative motion of said apparatus and the boat trailer to fore and aft axial motion; said longitudinal body including a front member, a rear member attached

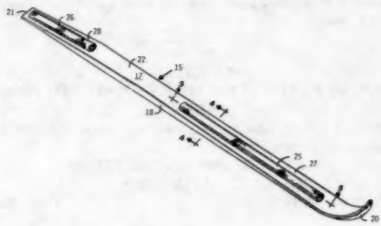
below and extending rearwardly from said front member, first coupling means associated with said front member, said coupling means associated with said rear member; and said first coupling means, second coupling means and means for limiting relative motion being substantially colinear.

4,679,813

SKI STIFF IN TORSION

Donald A. Girard, P.O. Box 172, Rancho Cordova, Calif. 95670

Filed Apr. 10, 1986, Ser. No. 850,280
Int. Cl.[4] A63C *5/07*
U.S. Cl. 280—602 **11 Claims**



1. A ski that is stiff in torsion and is flexible in the vertical direction, comprising

a ski body that is compliant both in beam and in torsion, having a bottom surface and a top surface, a curved-up front end, a rear end, and a ski binding area in between its ends for affixation of a user's ski boot, providing a forward top surface portion and a rear top surface portion,

at least one hollow elastomeric tubular hose supporting and reinforced by tightly helically wound braiding of high-tensile-strength filaments, rigidly secured to an upper surface portion said ski body, said hose extending lengthwise.

4,679,814

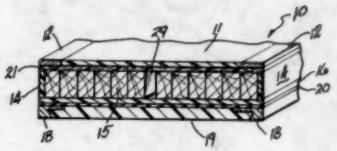
RANDOMLY ORIENTED REINFORCING FIBERS IN A SNOW SKI

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Manchester, both of Conn., assignors to TriStar Sports Inc., Middletown, Conn.

Continuation of Ser. No. 574,443, Jan. 27, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,320
Int. Cl.[4] A63C *5/12*
U.S. Cl. 280—610 **18 Claims**

1. In a snow ski of predetermined length having a core formed from a predetermined material, a top surface, a bottom running surface bounded on its opposing sides by metal edges, and a first side and a second opposing side positioned generally perpendicularly to the top and bottom surfaces and intermediate thereof, the improvement comprising:

at least one isotropic torsional reinforcing precured planar laminate layer intermediate the top surface and bottom running surface and generally parallel thereto extending laterally at least partially between the first side and the second opposing side and longitudinally extending substantially over the predetermined length of the ski, the at



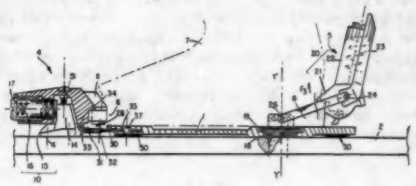
least one isotropic torsional reinforcing precured planar laminate layer being independent of the core and formed from fibers of high elastic modulus suspended in a matrix of predetermined material, the fibers being oriented randomly therein to thereby permit the torsional stiffness of the structure to be selectively predetermined.

4,679,815

SAFETY SKI BINDING

Roger Pascal, Annecy-Le-Vieux, and Jean P. Dimier, Rumilly, both of France, assignors to Salomon S.A., Annecy, France

Filed Jun. 18, 1984, Ser. No. 621,734
Claims priority, application France, Jun. 20, 1983, 83 10819
Int. Cl.[4] A63C *9/081*
U.S. Cl. 280—618 **27 Claims**



1. A ski binding for releasably securing a boot to a ski, said binding comprising:

(a) a pivotable plate adapted to be pivotably secured to said ski whereby said plate is pivotable on said ski around an axis substantially perpendicular to the upper surface of said ski, said plate pivoting to an unaligned position relative to said binding during release of said boot;

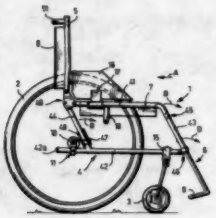
(b) first and second means for securing the front and rear of said boot onto said ski, said first means being elastically pivotable to allow for release of said boot with pivoting of said first means, wherein said second means is mounted on said plate;

(c) means for linking said first means with said plate whereby realignment of said first means relative to said binding is accompanied by automatic realignment of said plate, wherein said linkage means further comprises a linkage rod secured to said first means by a clip, said linkage rod being pivotable relative to said clip around an axis transverse to the axis around which said plate pivots relative to said ski, and wherein said clip is pivotable relative to said first means around an axis transverse to the axis around which said plate pivots relative to said ski to allow for height adjustment of said first means relative to said plate.

4,679,816
WHEELCHAIR

Heikki Riikonen, Forssa, Finland, assignor to Tunturipyörä Oy, Finland

Filed May 30, 1986, Ser. No. 868,578
Claims priority, application Finland, Jun. 7, 1985, 852297; Feb. 14, 1986, 860693
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—650 9 Claims



1. A wheelchair comprising a body portion (1), back wheels (2), and front wheels (3), which wheels (2, 3) are fastened to the body portion (1) and which body portion comprises side supports (4), upper supports (5), and lower supports (6), a seat portion (7) being positioned between said side supports (4), a back (8) in connection with the upper supports, and a foot support (9) in connection with the lower supports (6), and in which wheelchair the back wheels (2) are detachable and the body portion (1) is foldable when the wheelchair is changed from the using position into the transporting position, characterized in that the side supports (4) are formed by two elongated members: an upper and lower part (41) and (42) respectfully which extend roughly horizontally in the transporting position, and a front and back part (43) and (44) respectively which are pivoted to and interconnect said horizontal parts and are shorter than said horizontal parts; said lower supports (6) being fixed to said front parts (43) respectively while extending below said lower parts (42) respectively such that the lower supports (6) are movable in a rearward direction to extend generally horizontally adjacent the lower parts (42) when the wheelchair is moved into the transporting position.

4,679,817
FOLDING HAND TRUCK

Dieter Schüfer, Nassau/Lahn, Fed. Rep. of Germany, assignor to Leifheit AG, Nassau/Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 606,448, May 3, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 838,900
Claims priority, application European Pat. Off., May 11, 1983, 83104657.8
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—655 9 Claims

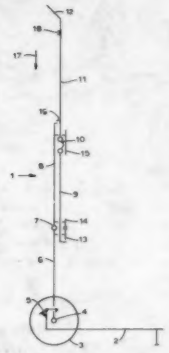
1. A simplified hand truck having a wheeled horizontal carrier part (2) foldably connected to a collapsible upright handle portion (1)

wherein, in accordance with the invention,

said upright handle portion (1) comprises two pairs of interarticulated, generally rectangular, planar frame sections, one (6, 8) of said pairs being stationary with respect to the wheels and the other (9, 11) of said pairs being slidable, within guide means (13, 14) provided on the stationary one (6, 8) of said pairs, between a retracted position and an extended position;

each of said pairs being internally hinged along adjacent edges of said frame sections by a respective hinge means (7, 10) to permit the frame sections defining a pair to rotate with respect to each other, with the four frame sections being so dimensioned that said two hing means (7, 10) are aligned with each other when said slidable pair (9, 11) is in said retracted position, thereby permitting collapse of said upright handle portion (1) by a single folding operation;

said slidable pair (9, 11), when in its extended position, locking the hinge means (7) of said stationary pair against relative rotation of the frame sections (6, 8) thereof, said



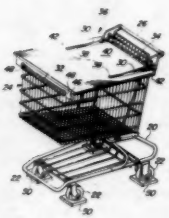
two hinge means (7, 10) then being out of alignment with each other; and

the overall length of said upright handle portion (1) being less when said slidable (9, 11) section pair is retracted than when said slidable pair is extended and serving as a locking element.

4,679,818
DISPLAY TABLE ATTACHMENT FOR SHOPPING CARTS

Dorothy A. Kakavas, Moline, Ill., assignor to Aadams Merchandising, Inc., Moline, Ill.

Filed Feb. 10, 1986, Ser. No. 827,580
Int. Cl.[4] A47B *23/00*
U.S. Cl. 280—33.99 A 6 Claims



1. A display table attachment for use with a shopping cart having a top-opening basket including front and rear transverse rails and left and right fore-and-aft side rails that together define a peripheral top rail structure that has a configuration such that the rear rail is higher than the front rail and the side rails slope downwardly and forwardly and also converge from front to rear: said display table attachment adapted to overlie and be supported by the rail structure and having a top flat surface of substantially rectangular shape dimensioned to extend from front to rear and side to side of the rail structure, front engagement means depending from the front part of the table for engagement with the front portion of the rail structure to hold the table against lateral and at least forward shifting relative to the basket, the rear part of the table being configured to adapt to the configuration of, and to be supported by, the rear portion of the rail structure, said rear table part configuration having notches converging on the order of the converging side rails and enabling the rear part of the table to

descend below the level of the high rail portion and thus to enable the overall level position of the table top surface and to stabilize the table against shifting laterally and rearwardly relative to the basket, and said front engagement means on the table being so dimensioned in cooperation with the configuration of the rear part of the table as to elevate the front part so that the table top surface as a whole is substantially level.

4,679,819

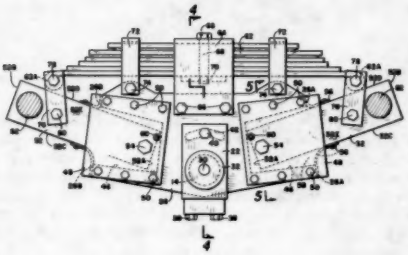
TRAILER SUSPENSION SYSTEM

Clyde O. Box, 3898 N. Memorial, Tulsa, Okla. 74115

Filed Jan. 31, 1986, Ser. No. 824,607

Int. Cl.[4] B60G *5/00*

U.S. Cl. 280—680 **1 Claim**



1. A tandem suspension system for a trailer in which the trailer has a structural member running along each opposed side thereof, the suspension system of each side comprising:

a shaft rotatably supported to the trailer structural member and extending perpendicularly and outwardly therefrom;

a rocker plate affixed to said shaft in a vertical plane parallel to and spaced from the trailer structural member, the rocker plate having a recess in each end;

a pair of rocker arms, each having an inner and an outer end, and having opposed parallel sides and top and bottom edges, the inner end of each rocker arm being pivotally received in a said recess in said rocker plate whereby the rocker arms extend away from each other and in a common plane with said rocker plate;

an elongated leaf spring having opposed ends, the spring being supported above said rocker plate;

shackles pivotally connecting each end of said spring to said rocker arm at a point spaced from the outer end thereof;

a pair of retainer plates secured to said each end of said rocker plate, each pair of retainer plates being secured to opposite sides of said retainer plate at a said recess therein in opposed paralleled relationship, the inner end of each of said rocker arms being received between a pair of retainer plates, the inner end of each rocker arm and each pair of retainer plates having aligned openings therein;

a bolt received in said aligned opening in each pair of retainer plates and said rocker arm received therebetween whereby each rocker arm is pivoted to a said pair of retainer plates, and wherein each of said rocker arms is formed of an elongated member having opposed paralleled side walls spaced apart a distance slightly less than the spacing between said retainer plates whereby said retainer plates guide the pivotal movement of said rocker arms in the plane of said rocker plate;

a grease retainer member affixed to the top and bottom edge of each of said rocker arms, each grease retainer slideably and sealably engaging said rocker plate, the said recess in each end of said plate being thereby closed and forming a grease receiving cavity; and

an axle affixed to each rocker arm adjacent the outer end thereof, each axle extending perpendicular to the plane of said rocker arms, each axle providing means to receive a wheel thereon.

4,679,820

REINFORCING UNIT FOR A LONGITUDINAL BEARER

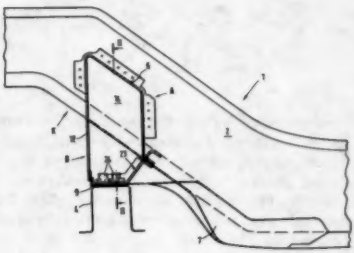
Rainer Srock, Leonberg; Ursula Herrmann, Weissach-Flacht, and Bernhard v. Rotberg, Hemmingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,531

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434452

Int. Cl.[4] B62D *21/02*

U.S. Cl. 280—781 **11 Claims**



1. A reinforcing unit in combination with a U-profile-shaped longitudinal extending bearer and a transversely arranged auxiliary bearer of a body structure of a passenger motor vehicle said transversely arranged auxiliary bearer providing for the support thereon of a lower wheel guide member and for the fastening of a steering mechanism and for the mounting of drive aggregates or parts of the force transmission, said reinforcing unit comprising form rigid-body means connected to the U-shaped longitudinal bearer and composed of several shell shaped elements and of closure panel means connected together within a vertical offset area of each longitudinal bearer, the form-rigid body means being constructed at least partly as box profile and forming together with the U-profile-shaped longitudinal bearer a fixedly connected structural unit having an abutment surface means for fastening the transversely extending auxiliary bearer to the longitudinal extending bearer at the vertical offset area, the shell shaped elements including a first shaped element connected, with a vertical web on the inside of the longitudinal bearer, the first shaped element having a transversely extending wall leading vertically away from the longitudinal bearer and being connected with a second shaped element for forming the abutment surface means within the vertical offset area of the longitudinal bearer and wherein the first shaped element extends in sloping and straight vertical planes defining a trapazoidal column and the second shaped element extends from the offset area obliquely to the vehicle longitudinal center axis in a horizontal plane matched substantially to the configuration of the longitudinal bearer.

4,679,821

SEAT BELT APPARATUS

Kazuo Yamamoto, Fujisawa, and Shuichi Asano, Kawasaki, both of Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,272

Claims priority, application Japan, Apr. 23, 1984, 59-80317

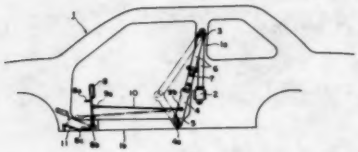
Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **12 Claims**

1. A seat belt apparatus comprising:

operating means operable by the foot of a person seated in position in a vehicle so as to move between either a first position or a second position which is separated away from said first position, said operating means including a pedal which is pivotally mounted on said vehicle so as to be pushed by a foot of said person seated in position;

restraining means which is normally located at a retracted position defined in said vehicle and which is moved out of said retracted position to be placed around said person to keep said person in a restrained condition wherein said restraining means includes a three point seat belt having a webbing to be placed around said person in position for establishing said restrained condition; and



connecting means for connecting said means operable by the foot of a person to said restraining means for moving said restraining means from said retracted position to an advanced position easily accessible by said person seated in position when said operating means is operated from said first position to said second position thereby allowing said person seated in position to grab said restraining means located at said advanced position without taking an uncomfortable posture.

4,679,822

INFORMATION DEVICES

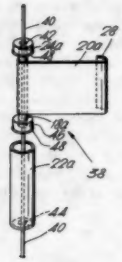
Maynard F. Wolfe, c/o Woodcraft Investments Limited, 1501 Hitchinson House, Central, Hong Kong

Filed Oct. 25, 1985, Ser. No. 791,549

Claims priority, application United Kingdom, Oct. 26, 1984, 8427086

Int. Cl.[4] B42D *19/00;* **B65D** *71/00;* **A45C** *11/26;* **G09F** *11/02*

U.S. Cl. 281—5 **13 Claims**



1. An information device comprising:

a relatively rigid support portion suitable for attachment to an object,

a relatively flexible information label capable of being secured to said relatively rigid support portion, said label when secured being extendable in use into an open state and also storable into a closed state relative said support portion,

a separate cover member attachable to said support portion to contain said label after said label is stored in said closed state, and detachable from said support portion to allow said label to be extended into said open state, and

sealing means for providing a water and air tight seal of an area containing said label when in said closed state.

4,679,823

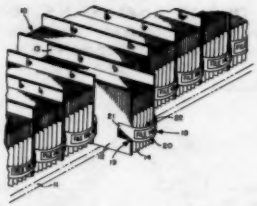
SHELF FILING SYSTEM WITH IDENTIFICATION HANDLE FOR FILE POCKETS

Francis J. Nagy, 33325 Rockford Dr., Solon, Ohio 44139

Filed Oct. 18, 1984, Ser. No. 662,372

Int. Cl.[4] B42F *21/00;* **B42D** *17/00, 9/00;* **B15D** *25/22*

U.S. Cl. 281—15 A **7 Claims**



1. In combination with a file pocket or other file holder for shelf filing systems adapted to be supported at a bottom edge thereof on a shelf and including front and back walls joined together at least along their bottom edges for retaining therebetween file materials, a strap having a central portion upon which identifying indicia may be applied, said strap further having respective ends joined to said front and back walls adjacent a side edge thereof with the central portion forming an open loop projecting outwardly beyond such side edge of the file pocket.

4,679,824

FLUID-TIGHT COUPLING FOR TWO SECTIONS OF A FLUID LINE

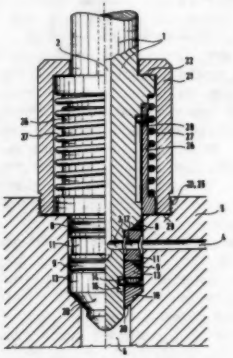
Francis Rodriguez, Vertou, and Jean-Paul Roblin, Nantes, both of France, assignors to Alsthom, Paris, France

Filed Mar. 24, 1986, Ser. No. 843,413

Claims priority, application France, Mar. 22, 1985, 85 04303

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—27 **3 Claims**



1. A fluid-tight coupling for two sections of a fluid line, comprising a cylindrical male fitting containing an axial channel, a radial opening in said cylindrical male fitting connecting said axial channel to the outside, said channel constituting a first section of said fluid line, said male fitting being sized to fit slidably into a bore machined into a mating part therefor, a second section of said fluid line being formed in said mating part and opening into said bore, the issuing orifice of said second line section being aligned with said radial opening in said male fitting when the male fitting has been driven home, said male fitting being provided with two axially spaced, upper

and lower ring seals located one on each side of said radial opening, said upper seal being furthest from the end of the male fitting and axially secured between a shoulder on the male fitting and a sliding ring on the male fitting, said sliding ring having a radial through-hole alignable with said radial opening of said male fitting and said issuing orifice of said second line section, said lower seal being axially secured between said sliding ring and a sliding bushing fitted over the end of the male fitting, said bore comprising a shoulder blocking said sliding bushing in the course of the male fitting penetrating the bore, said sliding ring having walls at opposite ends respectively in contact with the upper seal and the lower seal and wherein said seals have an outside diameter when uncompressed which is slightly smaller than that of said bore in the mating part such that the seals are compressed by the axially sliding bushing being stopped by said bore shoulder as the male fitting penetrates the bore and said seals are expanded radially to apply firmly against the wall of said bore.

4,679,825

PIPE CONNECTOR

Clive N. Taylor, 12 Fern Close, Burton, Christchurch, Dorset, England

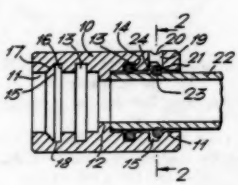
PCT No. PCT/GB83/00280, § 371 Date Jul. 16, 1984, § 102(e) Date Jul. 16, 1984, PCT Pub. No. WO84/01990, PCT Pub. Date May 24, 1984

PCT Filed Nov. 1, 1983, Ser. No. 626,786

Claims priority, application United Kingdom, Nov. 16, 1982, 8232690

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—93 **2 Claims**



1. A pipe connector comprising a body having a bore for receiving an end portion of a pipe, said bore being provided with a first circumferentially extending groove arranged to co-operate with a circumferentially extending groove provided on the exterior of said end portion of the pipe, a passageway provided in said body and extending from said first groove to the exterior of said body, a second circumferentially extending groove provided in said bore, a sealing ring disposed in said second groove for sealing engagement therewith and with the exterior of said end portion of the pipe, said first groove when co-operating with the groove on said end portion of the pipe forming therewith a channel in which a retaining rod or wire is inserted by being passed through said passageway, and said first groove having side wall means which is inclined relative to the axis of the bore to hold the rod or wire in the co-operating groove thereby to provide an axial interference preventing withdrawal of said end portion of the pipe from the connector; in combination with a template for determining the length of the retaining rod or wire, said template comprising a plate having a plurality of grooves, the length of each groove corresponding to the length of a retaining wire or rod required for use with a pipe of a particular diameter.

4,679,826

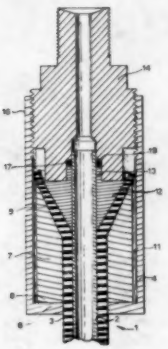
HIGH PRESSURE HOSE FITTING

John H. Olsen, Vashon, Wash., assignor to Flow Industries, Inc., Kent, Wash.

Filed May 6, 1985, Ser. No. 731,113

Int. Cl.⁴ F16L *39/00*

U.S. Cl. 285—149 **6 Claims**



1. A high pressure hose fitting for use in combination with a hose having an inner lining which is encircled by a layer of reinforcing cords and which defines the internal passageway of the hose, said hose fitting comprising:

an end portion of said hose, said end portion including an end segment of said inner lining and a corresponding end segment of said layer of reinforcement cords which has a lengthwise end section thereof separated from a lengthwise end section of said lining end segment, the latter being disposed in direct communication with said hose passageway along its entire extent and being constructed of a material such that high pressure within said passageway will cause it to swell outwardly to a limited extent;

a cylindrical housing having an opening for admission of said hose end portion at one end and a threaded opening at the other end for receiving an outlet fitting in a thread connected manner;

an outlet fitting threadably connected to said housing, said outlet fitting having a hollow interior for admission of and sealing to the liner end segment of said hose and a recess extending around the outside of said liner end segment;

a crimped sleeve disposed within said housing in intimate contact with the outside surface of the end segment of said cords layer, one end of said sleeve being disposed adjacent to the one end of said housing and defining a conical recess at its other end for gripping to and receiving the end segment of said cords layer;

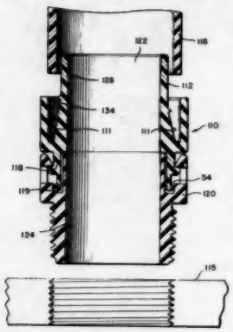
a conical, barbless ferrule having a hollow interior for receiving and sealing to the exterior of said inner liner end section of said liner end segment and a conical outer suface for clamping the separated end section of said cords layer of said hose end portion to the conical recess of said sleeve, said ferrule also including a projection which is expandable to a limited extent and which is located adjacent to the recess of said outlet fitting for sealing to said outlet fitting; and

an O-ring between said projection of said ferrule and said outlet fitting for sealing said outlet fitting to said ferrule.

4,679,827
RAINTIGHT AND OILTIGHT CONNECTOR FOR FLEXIBLE CONDUIT

Joseph P. Law, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 687,107, Dec. 28, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 770,899
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—158 9 Claims



1. A connector for coupling an electrical conduit to an electrical enclosure having an opening comprising:

a first elongate housing for receiving said conduit, said first elongate housing having a first passage therethrough; and

a second elongate housing engageable with said first housing for rotatable movement therebetween said second housing including a second passage therethrough in communication and axially aligned with said first passage, said second elongate housing including means for engagement with said electrical enclosure adjacent said opening;

said second elongate housing further including an open ended axially extending annular channel for receipt of a portion of said first housing;

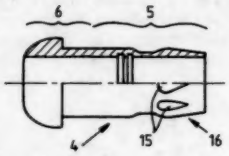
said channel being defined by a pair of substantially parallel circumferentially continuous walls, one wall of said pair being interior the other wall and defines a portion of said second passage, said one wall of said channel having a greater axial extent than the other said wall; and

said first housing including a circumferential annular projection extending outwardly therefrom, and said second housing including plural spaced deflectable locking elements extending upwardly from said other wall for deflectable engagement with said projection for rotatably securing said first housing to said second housing, wherein said portion of said first housing received in said channel includes an annular protuberance extending outwardly therefrom engaging the interior surface of said other wall of said channel, whereby an oiltight seal is formed therebetween.

4,679,828
CONNECTING DEVICE FOR PIPINGS, PIPES AND CONDUITS

Christian Bernardot, Plaisir, France, assignor to Permaswage S.A., Les Clayes-Sous-Bois, France

PCT No. PCT/FR82/00026, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02755, PCT Pub. Date Aug. 19, 1982
Continuation of Ser. No. 433,128, Sep. 28, 1982, abandoned. This PCT application Feb. 10, 1982, Ser. No. 817,776
Claims priority, application France, Feb. 11, 1981, 81 02694
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—175 7 Claims



1. A crimping connecting accessory for connecting rigid pipings, comprising an unthreaded sleeve having:

a tail section including a first malleable portion for a first connection of the radial crimping type onto the outer periphery of an end of a first pipe; and

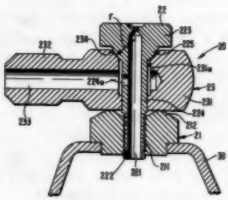
a head section including a second portion of higher hardness than said first malleable portion for a second connection of the dismountable type into a female member attached to an outer periphery of an end of a second pipe, said head section being of a larger diameter than said tail section, said tail section and said head section being joined to one another to form a single metal piece, wherein:

said first malleable portion comprises at least one zone for radial crimping onto an end piping and means for preventing said malleable portion from rotating with respect to said pipe on which it is crimped.

4,679,829
PORTING MEMBER WITH A UNIVERSAL COUPLING MECHANISM

Masahiro Yanagisawa, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jan. 23, 1986, Ser. No. 824,369
Claims priority, application Japan, Jan. 28, 1985, 60-9030[U]
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—190 4 Claims



1. In a porting member with a universal coupling mechanism including a connector means fixedly mounted on a container provided with a central hollow portion and radial hole to form a fluid passageway from the interior of said container to external equipment, and a port means rotatably supported on said connector means provided with a connecting hollow portion to complete the fluid passageway together with said central hollow portion and said radial hole whereby the desired position of one end opening of said connecting hollow portion can

be easily selected by rotation of said port means, the improvement comprising; said connector means having two surfaces which are opposite to one another with a gap between said surfaces, said surfaces contacting with the opposite side surfaces of said port means to form a sealing structure, a semi-spherical portion and an edge portion are formed on said surfaces of said connector means, respectively, said port means having a pair of oppositely facing surface portions, one of said surface portions having a bevelled configuration disposed to engage with said semi-spherical portion and the other of said surface portions being generally planar disposed to engage with said edge portion.

4,679,830

TUBE COUPLING

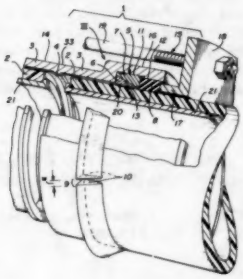
Frans J. J. A. Kok, AB Helden, Netherlands, assignor to Dresser Europe S.A., Belgium

Filed May 16, 1985, Ser. No. 735,224

Claims priority, application Netherlands, May 17, 1984, 8401586

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—323 **3 Claims**



1. A tube coupling **(1)** for connecting a tube portion **(2)** of synthetic resin with another conduit element, comprising:

a socket portion **(3)** surrounding the tube end of said tube portion **(2)** and having an abutment should therein;

at least one grip rim **(6)** disposed within the socket portion **(3)** and engaging the tube portion **(2)** and having a diverging clamping surface **(13)** diverging in the direction towards said other conduit element;

at least one sealing ring **(8)** disposed within the socket portion **(3)** adjacent the grip rim **(6)** of elastic material;

at least one clamping rim **(7)** disposed within the socket portion **(3)** and having a diverging clamping surface **(13)** diverging in the direction towards the tube portion **(2)** for contacting in a self disengaging and self engaging ramping relation with the diverging clamping surface **(13)** of said grip rim **(6)**;

loading means **(15)** for loading said clamping rim **(7)** and said sealing ring **(8)** with axial compression in the direction towards said other conduit element;

said loading means **(15)** comprising at least one pressing ring **(17)** penetrating into the socket portion **(3)** for engaging said clamping rim **(7)** through said sealing ring **(8)** and further including a plurality of tension bolts **(19)** engaging a flange **(18)** integrally formed with the pressing ring **(17)** for drawing the pressing ring **(17)** towards said other conduit element as said pressing ring **(17)** penetrates into the socket portion **(3)**;

said grip rim **(6)** having a saw teethed longitudinal section at its inner side, including teeth **(24)** having teeth surfaces **(25)** of said saw teethed longitudinal section converging in the direction towards the free end of said tube portion **(2)**;

at least one support sleeve **(21)** internally supporting said tube portion **(2)** of synthetic resin:

said grip rim **(6)** having at least one gap **(9)** at its circumference;

said gap **(9)** having a width (w) equal to the product of π and the inner diameter (D) of the grip ring **(6)** diminished by the product of π and the outer diameter (D') of the tube portion **(2)** diminished by the product of 2π and the height (h) of said teeth **(24)**;

said grip rim **(6)** having such total circumferential length, that during operation of compressing the grip rim **(6)** by causing the pressing ring **(17)** to engage the sealing ring **(8)** along its circumference which causes the sealing ring **(8)** to engage the clamping rim **(7)** along its circumference thereby axially compressing the sealing ring **(8)** and increasing the frictional force between the sealing ring **(8)** and the tube portion **(2)** and further causing the clamping rim **(7)** to engage the grip rim **(6)** along their contacting diverging surfaces **(13)**, thereby simultaneously causing the free ends **(41)** of the grip rim **(6)** bounding said gap **(9)** to interabut to prevent excessive constriction of the tube portion **(2)** while the teeth surfaces **(25)** of the saw teethed longitudinal section engage the tube portion **(2)** to thereby prevent movement of the tube portion **(2)** and;

said sealing ring **(8)** being further compressed between said clamp rim **(7)** and said pressure ring **(17)** when a force is exerted on the tube portion **(2)** in the direction towards the free end of tube portion **(2)** to thereby exert an increased force on said clamp rim **(7)** to thereby prevent movement of the tube portion **(2)**.

4,679,831

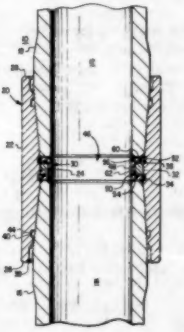
PIPE COUPLING CONNECTION SEALING APPARATUS

William P. Kielminski, 601 Cypress Station Dr., #203, Houston, Tex. 77090

Filed Jun. 13, 1986, Ser. No. 874,011

Int. Cl.[4] F16L *21/02*

U.S. Cl. 285—332.2 **6 Claims**



1. A pipe coupler for use with either lined or unlined pipes comprising:

(a) a pipe coupling connector means including a pipe connector member having a centrally disposed bore having a body portion with first and second ends and first and second recesses integral with the first and second body end portions; and

(b) a floating seal means operatively connected to the pipe connector member, said floating seal means responsive to the pipe being joined for floating to a final position thereby allowing torque to equalize on the ends of the joined pipes, said floating seal means being operatively mounted in said bore and including a cylindrically shaped metal ring operatively connected to the pipe connector member, said metal ring having first and second opposing

sides and ends, the opposing ends having recesses, and said first side and said first and second opposing ends of the metal ring being encased in a flexible sealing material whereby the ends of pipes being joined force the sealing material into the metal rings first and second recesses and into the bores first and second recesses to seal the ends of the pipes against leakage.

4,679,832

FLANGE RING FOR PIPES

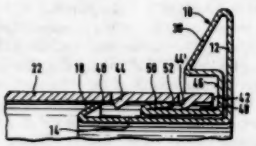
Manfred Meinig, Seitinger Strasse 186, D-7201 Rietheim-Weilheim 2, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,322

Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515737

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—414 **13 Claims**



1. A flange ring for mounting in an open pipe, said flange ring comprising:

flange means,

outer and inner leg means projecting from said flange means, said outer leg means closer to the inner wall of the pipe than said inner leg means when installed in the pipe, said outer and inner leg means being substantially parallel to one another and capable of being flexed under stress with respect to said flange means by the inner wall of the pipe when said leg means are driven into the open pipe,

outer and inner pipe engaging means inserted inside the pipe, said outer pipe engaging means projecting from said outer leg means toward the inner wall of the pipe when installed in the pipe, said inner pipe engaging means projecting from said inner leg means toward the inner wall of the pipe when installed in the pipe.

4,679,833

CLOSURE MECHANISM FOR SUITCASES OR THE LIKE

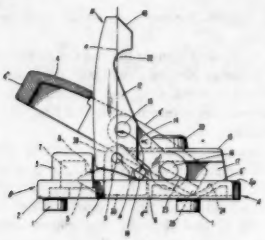
Rudi Dueringer, Wuppertal, Fed. Rep. of Germany, assignor to S. Franzen Sohne GmbH & Co., Solingen, Fed. Rep. of Germany

Filed Dec. 31, 1985, Ser. No. 815,078

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500862

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—113 **12 Claims**



1. A closure mechanism for suitcases or the like, comprising:

a counter-closure part, and

a closure part securable to said counter-closure part, said closure part comprising

a base plate,

a hasp of generally U-shaped configuration including a pair of legs interconnected by a bight, said bight arranged to engage said counter-closure part, said legs each carrying a connector arranged for linear displacement relative to said base plate and defining a first pivot axis about which said hasp is pivotable to move said bight toward and away from said base plate, at least one of said legs including a contact surface,

a handle pivotably mounted on said base plate for rotation toward said base plate about a second pivot axis to a closing position, and away from said base plate toward an opening position,

said handle including first and second mutually inclined lever arm means, said first lever arm means being longer than said second lever arm means and being manually engageable for pivoting said handle, said second lever arm means carrying lift pin means located below at least one of said legs extending into underlying relationship with said contact surface of said hasp, and

a pair of coupling links each pivotably connected to said handle and one of said connectors such that rotation of said handle toward said opening position causes said connectors of said hasp to be linearly displaced by said links, and causes said hasp to be rotated about said first axis by engagement of said lift pins with said contact surface.

4,679,834

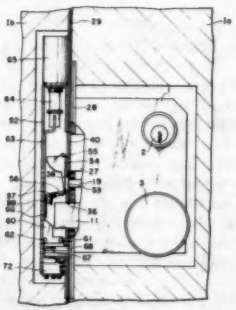
DOOR UNLOCKING DEVICE

Motohiro Gotanda, 1802-10, Nakabyo, Abiko-shi, Chiba-ken, Japan

Filed Dec. 3, 1985, Ser. No. 804,085

Int. Cl.[4] E05C *1/06*

U.S. Cl. 292—169.13 **7 Claims**



1. In combination with a door supported at one edge by a door frame, said door being locked with a lock apparatus which includes a front plate adapted to be fixed to one side edge of the door; outer and inner door knobs adapted to be secured to outside and inside surfaces of the door, respectively; a latch bolt which is adapted to be displaced between a first position where one end portion of the latch bolt is protruded from the front plate and a second position where the latch bolt is retracted therefrom, which is normally urged to be displaced toward the first position and which is cooperable with the inner door knob so that the latch bolt may be displaced to the second position by rotation of the inner door knob; and a trigger bolt which is adapted to be displaced between an extended position where one end portion of the trigger bolt is protruded from the front plate and retracted position where the trigger bolt is retracted therefrom, which is normally urged

to be displaced toward the extended position, which is engageable with the latch bolt so that the movement of the latch bolt from the first to second position necessarily causes the movement of the trigger bolt form the extended to retracted position, and which is capable of acting on the latch bolt when the trigger and latch bolts arae in the retracted and first positions, respectively, so that the latch bolt is locked and prevented from being displaced from the first to second position, the locking of the latch bolt with the trigger bolt being released by displacing the trigger bolt to the extended position; a device for unlocking said door comprising:

a casing having a strike and adapted to be mounted on the door frame with the strike being flush with the surface of the door frame adjacent to the door;

a first opening provided in said strike at a position so that when the door is closed the latch bolt can enter said first opening and can be positioned in said first, protruded position;

a second opening provided in said strike at a position so that when the door is closed the trigger bolt can enter said second opening and can be positioned in said extended position;

stopper means provided within said casing and adapted to be displaced between a service position where the trigger bolt is engaged by said stopper means and is prevented from entering said second opening and from being positioned in said extended position when the door is closed, and a non-service positon where the trigger bolt is permitted to be psoitioned in said extended position;

pushing means provided within said casing, adapted to be displaced between a first location and a second location and capable of displacing the latch bolt which is positioned in said first position to said second position by its movement from said first location to said second location when the door is closed;

means for moving said stopper means between said service and non-service positions; and

means for moving said pushing means between said first and second locations.

4,679,835

HALF TURN CABINET LATCH WITH THREE-PART PRIMARY OPERATING ELEMENT

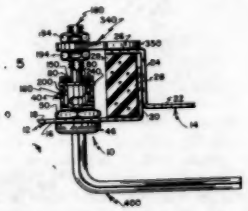
Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Hts., both of Ohio, assignors to The Eastern Company, Strongsville, Ohio

Continuation-in-part of Ser. No. 761,038, Jul. 31, 1985. This application Sep. 30, 1985, Ser. No. 781,662

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] E05C 3/06

U.S. Cl. 292—197 **22 Claims**



1. A clamping type cabinet latch, comprising:

(a) body means having a generally cylindrical body for mounting the latch on a closure or the like, the body having a passage extending therethrough along an imaginary center axis;

(b) pawl means that is rotatable and translatable relative to the body along the center axis for movement among unlatched, latched, and latched-clamped positions for selectively releasing, retaining, and securely clamping the closure in a closed position relative to an associated cabinet door frame or the like;

(c) operating element means for rotation relative to the body through a limited range of movement in clockwise and counterclockwise directions about the center axis for operating the latch;

(d) operating component means including an assembly of operating components that are protectively nested within the body for drivingly interconnecting the operating element means with the pawl means for effecting movement of the pawl means relative to the body among said unlatched, latched, and latched-clamped positions in response to clockwise and counter-clockwise rotations of the operating element means about the center axis, with the assembly of operating components being nestable one within another and being insertable as an assembly into the body;

(e) retainer means for cooperating with the body for releasably retaining the assembly of operating components within the body but being removable with ease to provide access to the operating components for lubrication, service and repair;

(f) the assembly of operating components including:

(i) an elongate, generally cylindrical shank having a forward end region, a rearward end region, and an outer surface that interconnects the forward and rearward end regions, the shank being oriented to extend substantially concentrically along the central axis with its forward end region positioned within the body passage, with its outer surface extending from within the confines of the body passage and rearwardly out of the body passage, and with its rearward end region located rearwardly with respect to the body, the shank having a generally radially extending hole formed therethrough with opposed ends of the hole opening through the outer surface of the shank at a location within the confines of the passage;

(ii) a pin having a central portion that is received by the hole formed in the shank, and having opposed end regions that project radially outwardly from the outer surface of the shank into close proximity with diametrically opposed portions of the inner surface of the body passage;

(iii) inner plug means formed as a one-piece member that extends along the center axis and has forward and rearward ends, the inner plug means having:

(A) a generally cylindrical sleeve portion having a substantially uniform outer diameter that extends concentrically about and axially along the center axis from the forward end of the inner plug means toward the rearward end thereof;

(B) interconnection means for interconnecting the inner plug means and the body to prevent relative rotation therebetween;

(C) a hole formed through the sleeve portion and through the washer-like portion and having a substantially uniform inner diameter that extends along the center axis, with the inner diameter being operable to journal the outer surface of the shank for rotation therein relative to the inner plug means; and,

(D) a pair of generally L-shaped slots formed in the sleeve portion and opening through the inner diameter and the outer diameter of the sleeve portion, with each of the slots having first and second leg portions that extend substantially orthogonally relative to each other, with the first leg portions extending substantially axially with respect to the center axis, and with the second leg portions extending substantially circumferentially about the sleeve portion, and with the opposed end regions of the pin extending through the generally L-shaped slots;

(iv) outer plug means formed as a three-piece assembly of interfitting parts that extends along the center axis and has forward and rearward ends, the outer plug means having a pair of semi-circular sleeve halves and a generally cylindrical core, with the sleeve halves being arranged to form a tubular structure with portions thereof surrounding and

interfitting with portions of the core to establish driving connections among the sleeve halves and the core, and with the sleeve halves and the core cooperating to define:

(A) a generally cylindrical sleeve portion having a substantially uniform outer diameter that extends concentrically about and axially along the central axis from the rearward end of the outer plug means toward the forward end thereof, the uniform outer diameter of the outer plug means being of a size that enables it to be journaled for smooth rotation about the center axis by the inner diameter of the body;

(B) a relatively reduced diameter portion that defines the forward end of the outer plug means, the reduced diameter portion being formed integrally with the sleeve portion and extending along the center axis into the reduced diameter forward end region of the passage formed in the body;

(C) a hole formed in the sleeve portion and opening through the rearward end of the outer plug means, the hole having a substantially uniform inner diameter that extends along the center axis, the inner diameter being operable to journal the outer diameter of the inner plug means for rotation therein relative to the outer plug means; and,

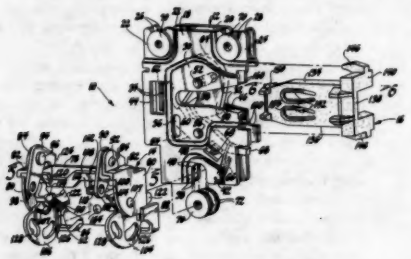
(D) a pair of generally curved cam slots formed in the sleeve portion and opening through the inner diameter and the outer diameter and the sleeve portion, with each of the slots defining cam surfaces that receive end regions of the pin.

4,679,836

CLOSURE LATCH

Dominic S. Pupillo, Sterling Heights, and Luben Scheff, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1986, Ser. No. 842,151
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **8 Claims**



1. A vehicle body closure latch formed of the same units assembled in either a right hand or a left hand configuration, comprising, in combination,

a latch unit having a vertical center line about which the latch unit is rotatable 180° between a right hand position and a left hand position and including:

a frame having right hand and left hand sides,

a latch bolt mounted on the frame for movement between latched and unlatched positions,

a detent mounted on the frame and engageable with the latch bolt for maintaining the latch bolt in latched position,

a latch actuating unit mounted to the right hand side of the frame in a right hand latch configuration and mounted to the left hand side of the frame in a left hand latch configuration, the actuating unit including:

a spaced pair of detent release levers movable between operating and bypass positions,

means interconnecting the detent release levers for concurrent movement between the positions thereof,

one detent release lever being connectable with the detent to release the detent and the other detent release lever concurrently moving with the one detent release lever when the detent release levers are in operating position and the actuating unit is mounted to the right hand side of the frame in a right hand configuration,

the other detent release lever being connectable with the detent to release the detent and the one detent release lever concurrently moving with the other detent release lever when the detent release levers are in operating position and the actuating unit is mounted to the left hand side of the frame in a left hand configuration,

a pair of operating levers, each engageable with one detent release lever to concurrently move the one and the other detent release levers when the release levers are in operating position and release the detent,

latch actuating means operatively connected to at least one of the detent release levers for concurrently moving the one and the other detent release levers between the operating position and the bypass position, the operating levers bypassing the detent release levers when the detent release levers are in the bypass position,

a bumper unit mounted to the same side of the frame of the latch unit as the actuating unit for guiding relative movement of the latch bolt and a striker, and

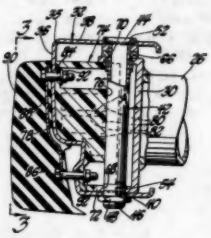
cooperating means on each of the units for assembling the units in the right hand and left hand configurations.

4,679,837

HARD BAR BUMPER FOR VEHICLES

Dean M. Bayer; Larry J. McCoy, both of Anderson, Ind.; Chris A. Thomason, Sterling Heights, Mich.; Thomas P. Tranbarger, Pendleton, and Marco E. Rodriguez, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 4, 1986, Ser. No. 848,202
Int. Cl.[4] B60R *19/04*
U.S. Cl. 293—102 **4 Claims**



1. A bumper assembly for operative connection to a vehicle having a body comprising a bumper beam of selected wall thicknesses having an outer generally vertical face and upper and lower generally horizontal flanges extended toward the body of the vehicle, each of said flanges having an opening therethrough, tie bolt means extending through said holes for mechanically interconnecting said flanges to one another, said tie bolt means having a head at one end mounted adjacent to said outer surface of one of said flanges, fastener means received by the other end of said tie bolt means adjacent to the outer surface of the other of said flanges for directly mechanically connecting said flanges to one another, an energy absorbing bulk head extending from seating engagement on the tie bolt means to a terminal position engaging the inner surface of the outer face of the bumper beam, and means for attaching said bulk head to said bumper beam so that impact loads imparted to said generally vertical face are transmitted by said bulk head to said tie bolt means and along the length thereof to

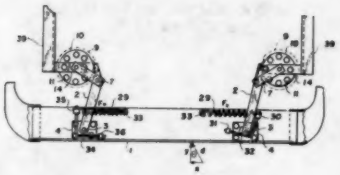
said upper and lower flanges to thereby inhibit dishing of said outer face of said bumper beam.

4,679,838

VEHICLE COLLISION BUMPER

Stanley J. Mikina, 4782 Coquina Key Dr., SE., St. Petersburg, Fla. 33705

Filed Apr. 14, 1986, Ser. No. 851,208
Int. Cl.[4] E05C *1/02*
U.S. Cl. 293—137 **5 Claims**



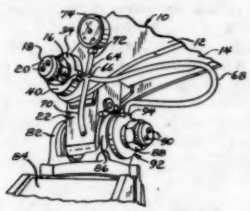
1. In a vehicle collision bumper, the combination of a stacked assembly of frictionally engaged discs on each side of a toothed ring, a ratchet member engaging said toothed ring, with said ratchet member guided by a pair of radius arms pivoted on the disc axis, links connecting the radius arms with the bumper, with said links pivoted at the ratchet pivot at one end and at a parallel pivot on the bumper at the other end, the link connection at the bumper including means for automatically engaging or disengaging the links from centering springs that are adapted for biasing said links with said set-up forces, with aforesaid set-up springs establishing a link centering moment due to the set-up spring force acting in conjunction with the reaction on the link pivot at the bumper, a similar set-up spring system at each end of the bumper, a reset spring on the disc axis also biasing the ratchet member into engagement with the toothed ring, with said reset spring also biasing the radius arms and connected bumper links for return to their initial position after a collision.

4,679,839

GRAPPLE SNUBBER

Tony R. Damron, 8301 Bell Fountain Dr., Ocean Springs, Miss. 39564-9049

Filed May 7, 1986, Ser. No. 860,554
Int. Cl.[4] B66C *1/00*; F16F *9/00*
U.S. Cl. 294—119.4 **4 Claims**



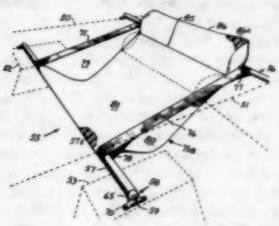
1. The combination in a log skidder comprising a lifting arm, a grapple and means suspending said grapple from said arm comprising a body, a first pivot member suspending said body from said arm and pivotable about a first substantially horizontal axis, a second pivot member substantially perpendicular to said first pivot member suspending said grapple from said body and pivotable about a second substantially horizontal axis substantially perpendicular to said first substantially horizontal axis, first hydraulic snubber means acting between said arm and said body to inhibit movement between said arm and said body, second hydraulic snubber means acting between said body and said grapple to inhibit movement between said grapple and said body, and hydraulic means for operating said first hydraulic snubber means and said second hydraulic snubber means to inhibit such movement, each said hydraulic snubber means comprising a block having a central bore receiving the respective pivot member, said block having a face-opening recess concentric with and spaced radially outwardly from said bore and defining a ring-shaped cylinder, and a ring-shaped piston in said cylinder.

4,679,840

SEAT FOR A TRUCK BED

Steven A. Fry, 30052 Running Deer La., Laguna Niguel, Calif. 92677, and Rodney L. Stafford, 100 S. Seranada, #44, Orange, Calif. 92669

Continuation of Ser. No. 829,453, Feb. 10, 1986, abandoned, which is a continuation of Ser. No. 622,136, Jun. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 567,269, Dec. 30, 1983, abandoned. This application Sep. 22, 1986, Ser. No. 910,329
Int. Cl.[4] B60N *1/00, 1/12*; A47C *7/36*
U.S. Cl. 296—64 **15 Claims**



1. A seat for a truck bed, which truck bed has an axis of forward movement, and a lateral dimension of a substantial width, said seat comprising:

a forwardly located, and a rearwardly located runner, each extending laterally across the truck bed, and each having a pair of ends, each said runner comprising a pair of telescopically engaged and overlapping tubular sections which enable the length of said runners to be lengthened or shortened;

four attachment means, each adapted to attach a respective end of a runner to said truck bed, the two attachment means respective to one of said runners being adapted to be attached to said truck bed higher than the two attachment means respective to the other said runner, whereby one runner is higher than the other, the runners being parallel to one another; and

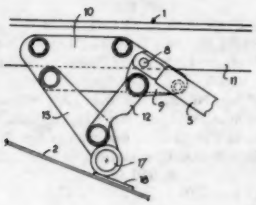
a seat member supported by and extending between both of said runners, said seat member comprising a flexible inelastic central sheet of substantial width to accomodate an occupant, having a slack length greater than a straight-line distance between the runners in order to form a concave cavity to receive and seat the occupant, a pair of flexible, inelastic side panels conforming in edge shape to a slack contour of said cavity, each attached continuously to a respective edge of the central sheet and extending generally upwardly and, a pair of side bands of flexible inelastic material having a substantial width and being supported by and extending between said runners, and having a length shorter than the slack length of said edges of the central sheet, whereby to form side restraints and arm rests, and to make the side panels taut; the upper edges of the side panels being continuously attached to a respective side band so each side panel forms a respective closure of the seat cavity at the edge; whereby to provide lateral stability and support for an occupant.

4,679,841

COUNTERBALANCING DEVICE FOR HATCHBACK LID ON A ROAD VEHICLE

Claude Taunay, Velizy, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur-Seine, both of, France

Filed Sep. 19, 1986, Ser. No. 909,185
Claims priority, application France, Sep. 23, 1985, 8514075
Int. Cl.[4] B62D 25/12; E05F 11/00, 1/12
U.S. Cl. 296—76 4 Claims



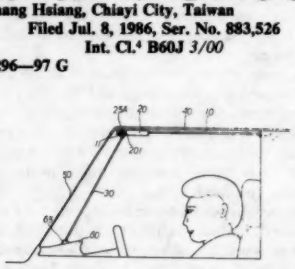
1. A counterbalance device for a rear hatchback lid on a road vehicle, said lid being hinged at a top on superstructure of the vehicle about a horizontal axis and comprising at least one counterbalance unit one end of which is pivoted on the superstructure and the other end to the lid, characterized in that said counterbalance unit is pivoted to one of said lid and said superstructure by means of an input lever and a camming lever both pivoted at a first end portion to said one of said lid and said superstructure, said counterbalance unit being pivoted to said input lever, a link pivoted at opposite end portions to said input and camming levers, a second end portion of said camming lever having a roller bearing against the other of said lid and said superstructure during initial movement of said lid from a closed position.

4,679,842

RETRACTABLE GLARE SHIELD DEVICE FOR AUTOMOBILES

Tsai Hwang-Change, No. 139, 6 Ling, Nan Jing Sugar Factory, Shui Shang Hsiang, Chiayi City, Taiwan

Filed Jul. 8, 1986, Ser. No. 883,526
Int. Cl.[4] B60J 3/00
U.S. Cl. 296—97 G 1 Claim



1. An extractable glare shield device for automobiles mainly compring:

a track bar inclinedly disposed on the ceiling of a vehicle, and an L-shaped hook being attached to the front end thereof and a stop means to the opposite end thereof;

a slider member slidably mounted on said track bar having a pair of shaft bars disposed respectively on both sides thereof with the center line of said shaft bars always parallel to the windscreen of of the vehicle;

a stiff transparent filter plate which is tinted for the purpose of filtering sunlight and configured with one of its corners removed and a slot-like opening positioned near the front side thereof for ready operation;

a pair of C-shaped clips rotatably mounted on said shaft bars respectively being used to detachably affix said filter plate to said slider member;

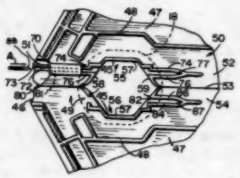
and the above said components being assembled in such a manner that the filter plate can be pulled down from the ceiling of said vehicle and positioned behind said windsereen for shielding glare sun beam, and be horizontally received under the ceiling thereof for space-saving purpose.

4,679,843

VISOR MOUNTING CLIP

Scott A. Spykerman, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 26, 1984, Ser. No. 686,158
Int. Cl.[4] B60J 3/02
U.S. Cl. 296—97 K 5 Claims



1. A visor having a mounting clip assembly for one end of the visor for detachably securing said one end to a linearly extending, cylindrical socket mounted to a vehicle, said visor formed of at least one core means constructed of plastic material comprising:

said visor core means including a pin guide and support channel, said channel formed by parallel ribs extending inwardly from one end of said core corresponding to said one end of said visor, said channel having an opening at one edge of said visor for receiving a pin therein, said ribs forming said channel extending adjacent and parallel to a longitudinal edge of said visor, said core including a recess formed therein and extending from said longitudinal edge of said visor in orthogonal relationship to and intersecting said channel;

a collar means positioned within said channel adjacent said opening;

cylindrical solid pin means extending within said channel through said collar means and between said ribs, said ribs being tapered at the innermost ends of said channel remote from said opening, whereby said pin means is wedged into said collar means and tapered ends of said ribs which secure said pin means in place against rotation or other movement in said channel; and

a cylindrical sleeve coaxially surrounding said pin in the area extending substantially entirely across said recess, said sleeve having an inner diameter greater than the outer diameter of said pin to permit rotation of said sleeve around said pin with said pin extending through the entire length of said sleeve.

4,679,844

FASTENING ARRANGEMENT FOR A CONVERTIBLE BOOT

Gerald T. Wolford, Frazer; Dwight R. Kleinlein, Washington, and Hubert F. Stewart, Rochester, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

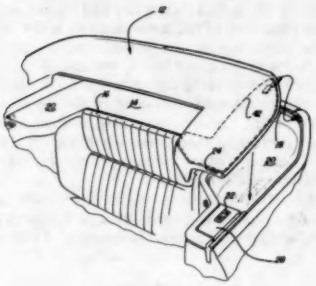
Filed Mar. 10, 1986, Ser. No. 837,937
Int. Cl.[4] B60J 7/20
U.S. Cl. 296—136 6 Claims

1. In a motor vehicle having a convertible top, a storage well for receiving a foldable top of the vehicle, said well having top linkage receiving areas at forward extensions of the well laterally flanking the rear seat area of the vehicle, and a boot for

overlying the storage well when the top is stored therein, a fastening arrangement for securing the boot to the vehicle comprising:

a trim panel member disposed forward of each well area adjacent the side of the vehicle and laterally flanking the rear seat;

a housing member in each trim panel;



a bolt slidably disposed on said housing; and

a keeper carried at each side of said boot so as to be in overlying relationship to said housing, said keeper extending into said housing and in locking engagement relationship with said bolt when the boot is positioned over the well.

4,679,845

MOTOR VEHICLE WINDSHIELD COWL PLATE

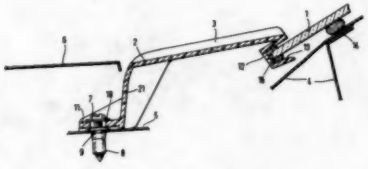
Heinz Detampel, Russelsheim; Frank Hillemann, Ginsheim; Wolfgang Jobst, Nauheim, and Manfred Prien, Enkenbach, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1985, Ser. No. 760,898

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428293

Int. Cl.[4] **B62D** *25/10, 27/00;* **B60J** *1/02*

U.S. Cl. 296—192 **3 Claims**



1. In a motor vehicle body, a structure adapted to close the space between the hood, a windshield fixed on the vehicle body structure and the fenders, comprising:

said windshield being adhesively secured to the vehicle body and having an exposed cantilevered lower edge extending freely forwardly and downwardly relative the vehicle body structure to which the windshield is adhesively attached;

and a molded plastic windshield plate adapted to substantially close the space between the hood, fenders and the windshield, said windshield plate having a rearward edge and an integral channel member disposed on the rearward edge defining a groove receiving the cantilevered lower edge of the windshield to provide a substantially flush adjoining relationship between the windshield plate and the windshield and function to mount the rearward edge of the windshield plate on the vehicle body and yet enable lateral movement of the windshield plate relative to the windshield whereby the plastic windshield plate adjustably closes the space between the hood, the fenders and the fixed windshield.

4,679,846

SLIDING AND LIFTING ROOF WITH TILTABLE SLIDING LINER PANEL CONTROLLED BY A GUIDANCE ARRANGEMENT

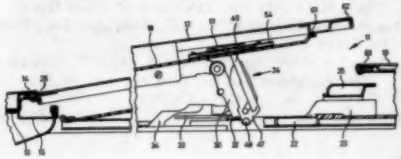
Horst Lux, Herrenberg, and Walter Schätzler, Stockdorf/Gauting, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting and Daimler-Benz Aktiengesellschaft, Stuttgart, both of, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,410

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442615

Int. Cl.[4] **B60R** *13/02;* **B60J** *7/047, 7/05, 7/057*

U.S. Cl. 296—214 **20 Claims**



1. Sliding and lifting roof construction for vehicles having a rigid cover, which in a closed position closes a roof opening in a fixed roof surface, said cover being mounted on guide tracks that extend along each side of the roof opening and connected to lifting mechanisms disposed at opposite sides thereof in a manner enabling the cover to be selectively pivotally lifted so as to raise a rear end of the cover above the fixed roof surface, and slidably displaced after lowering of its rear end below the fixed roof surface, and a tiltable, sliding roof liner panel, which is slidable together with the cover and which, upon raising the cover, is induced into a raising movement that, starting from said closed position, is faster than the raising movement of the cover; wherein the tiltable sliding roof liner panel, at least on one of its sides, is coupled with a pivotable lifting arm whose axis of pivot is positioned below said liner panel for substantially all raised positions of said liner panel, said pivotable lifting arm being coupled to a lifting lever of a respective one of said lifting mechanisms located at said one side of the coverby a means for positively guiding the pivotal movement of the lifting arm in response to movement of said lifting lever in a manner producing said pivotal movement of the liner panel which is faster than said pivotal movement of the cover.

4,679,847

REMOVABLE CAB TOP FOR VEHICLES

Ronald L. Dirck, P.O. Box 196, Warsaw, Ind. 46580

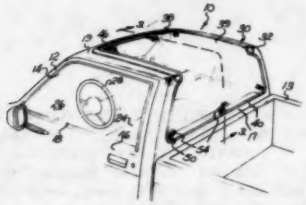
Filed Jul. 1, 1986, Ser. No. 880,698

Int. Cl.[4] **B60J** *7/00*

U.S. Cl. 296—218 **6 Claims**

1. A removable top in combination with a vehicle, wherein said vehicle includes a cab having a roof and adjoining rear wall, said cab further including corner located support posts connected by upper side rails, an opening means formed in said cab roof between said side rails and extending into said cab rear wall between said support posts, said removable top being

formed of transparent sheet material covering said cab opening means between said support posts and side rails and forming a



continuation of said cab roof, fastening means associated with said top and cab for detachably connecting the top to the cab.

4,679,848

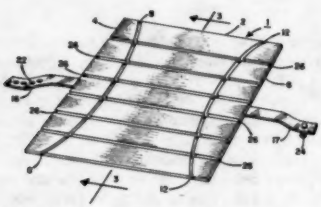
BACK SUPPORT MECHANISM AND METHOD

Petrus A. M. Spierings, 85 E. India Row, Apt. 24C, Boston, Mass. 02110

Continuation of Ser. No. 700,736, Feb. 11, 1985, abandoned. This application Aug. 14, 1986, Ser. No. 895,590

Int. Cl.[4] A47C 7/46

U.S. Cl. 297—284 **45 Claims**



34. A spinal appliance for directly controlling the posture of a human lower back of a human spine of a nominal human subject by so contacting the lower back as to consistently force lower back vertebrae repeatedly into their appropriate lumbar curvature in response to sitting in a chair in which the appliance is positioned at the back of the chair in position to confront the lower back vertebrae of the nominal human subject, comprising:

a posture-controlling support sheet having a front and a back and defining a plane, said sheet formed of a resilient material having a thickness and rigidity sufficient to support the lower back, said sheet having a posture-correcting two-dimensional lower-back-contacting surface having a longitudinal length as long as the lower back of the nominal human subject is long and a transverse width at least as wide as the spine thereof is wide;

a strength and form imparting lever defining a major plane, said lever formed of a resilient material having a length no longer than the length of the posture-controlling support sheet and having a width;

a substantially arcuate articulation coupling said posture-controlling support sheet and said strength and form imparting lever along an arcuate joint defining a preselected slope, said joint being generally centrally located with respect to said back of said sheet;

said two-dimensional surface of said sheet is selectively formable into a posture-correcting shape in response to angular motion of said lever about said arcuate joint from an initial condition in which the planes of the lever and sheet are generally parallel to an operative condition in which the lever is generally transverse the posture-controlling sheet at a selected angular orientation thereto;

one of the dimensions of the two-dimensional surface of the posture-controlling sheet in the posture-correcting shape is curvilinearly extending with a preselected curvature, the other dimension of the two-dimensional surface of the posture-controlling sheet in the back supporting shape is generally linearly extending;

the lever having a thickness, width and rigidity sufficient to prevent buckling of the lever along its width in response to the contacting of the lower-back-contacting surface and the lower back of a human subject;

said preselected slope of the arcuate joint is selected such that said preselected curvature of the two-dimensional surface of the posture-controlling support sheet in the posture-correcting shape everywhere locally conforms to the lumbar curve of the vertebrae of the lower back of the nominal human subject; and

adjustable means coupled to said lever for maintaining said lever fixed against angular motion in its operative condition at any selected angular orientation of said lever.

4,679,849

METHOD AND AN INVALID CHAIR FOR CONVEYING A PERSON HAVING LIMITED ABILITY TO MOVE WITHOUT HEAVY LIFTING FROM A SITTING TO A LYING POSITION

Jan Torgny, Örebro, Sweden, assignor to JATAB, Jan Torgny AB, Sweden

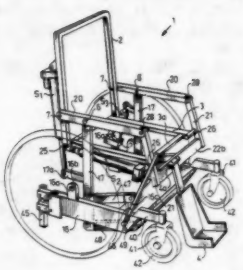
PCT No. PCT/SE85/00180, § 371 Date Dec. 10, 1985, § 102(e) Date Dec. 10, 1985, PCT Pub. No. WO85/04799, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 18, 1985, Ser. No. 834,276

Claims priority, application Sweden, Apr. 19, 1984, 8402222

Int. Cl.[4] A61G 5/00

U.S. Cl. 297—330 **8 Claims**



3. A wheelchair for moving a person of limited mobility from an upright sitting position to a recumbent position, said wheelchair (**1**) comprising:

a wheeled frame structure comprising at least a fixed horizontal frame structure (**16**) and a vertical frame structure (**17, 17***a*, **47, 48**);

a seat structure (**3**) having a front portion, a rear portion and an arm rest structure (**20, 21**);

a back rest (**2**);

a leg rest (**4**);

first and second journals (**25, 26**) respectively arranged in the regions of the front portion and rear portion of the seat structure, said first journal (**25**) connecting said back rest to said rear portion of said seat structure, and said second journal (**26**) connecting said leg rest to said front portion of said seat structure;

a third journal (**7**) connecting said arm rest structure (**20**) to said back rest;

a fourth journal (**6**) connecting said arm rest structure of the

seat structure (3) and a member (17) of the vertical frame structure, said fourth journal being located close the center of gravity of a person sitting in the wheelchair and about which the back rest and seat structure (3) can be swung;

a first drive means connecting said back rest (2) to said vertical frame structure (17*a*), said first drive means enabling the back rest and said seat structure to be swung about the fourth journal, while retaining the mutual relative positions of the back rest and seat structure unchanged, to a first position in which the major part of the pivotal movement of the back rest (2) towards its horizontal position has been completed;

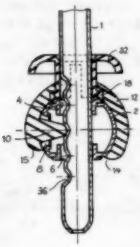
a second drive means (S2) connected between said rear position of said seat structure and said leg rest, said second drive means operable when said back rest and seat structure are in said first chair position for movement of the seat structure (3) and back rest (2) in mutually opposite directions to a second position in which the back rest and the seat structure lie substantially in register with each other in a horizontal plane.

4,679,850

DEVICE FOR FIXING A HEADREST ON A VEHICLE SEAT STRUCTURE

Francois Bianchi, Valentigney; Denis Busa, Audincourt, and Francois Fourrey, Montbeliard, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Jun. 13, 1986, Ser. No. 873,928
Claims priority, application France, Feb. 11, 1986, 86 01845
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—410 **9 Claims**



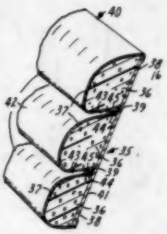
1. A device for slidingly mounting on a seat structure a headrest extended by at least one support bar having at least one notch, said device comprising a framework tube of the seat structure, the tube having a lower side portion, an upper side portion and an intermediate lateral side portion, a lower orifice and an upper orifice which are respectively provided in said lower side portion and said upper side portion of said tube for slidingly receiving said support bar, said orifices being suitable spaced apart for guidingly maintaining said support bar, in a given orientation in a transverse plane intersecting said tube, and a third orifice provided in said lateral side portion of said tube between said upper and lower orifices, a split collar engaged on and locally covering said tube and a lug resiliently carried by the split collar and extending through said third orifice for cooperation with said notch in the support bar and immobilizing said bar relative to said tube.

4,679,851

CUSHION AND METHOD

O. B. Solie, Rockford, Ill., and Godfrey J. Pyle, Shoreview, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 31, 1985, Ser. No. 761,000
Int. Cl.[4] A47C *31/02*; B68G *7/05*
U.S. Cl. 297—452 **14 Claims**



1. A cushion comprising a resiliently compressible pad having major front and rear surfaces and at least one opening through and disposed at about a right angle to the front and rear surfaces, an enclosure assembly having an inner surface surrounding and comprssing the pad comprising a rear cover overlying the rear surface of the pad and a front cover overlaying the front surface of the pad and having a part extending into said opening, and fastener means for retaining said part of the front cover in the opening to compress the pad comprising a first fastener portion including a backing, stems projecting from the backing, and heads at the ends of the stems opposite the backing with hook like parts projecting along the stems toward said backing, and a second fastener portion having a backing with a front surface and a multiplicity of loops projecting from said front surface engaged around the hook like parts of said first fastener portion, one of said fastenfer portions being attached to a part of said rear cover at said opening and the other of said fastener portions being attached to the part of said front cover in said opening.

4,679,852

REMOTE HARNESS WEB ADJUSTER

James R. Anthony, and Allan R. Lortz, both of Carmel, Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 810,340, Dec. 17, 1985. This application Jun. 30, 1986, Ser. No. 880,128
Int. Cl.[4] A43C *11/00, 31/00*
U.S. Cl. 297—464 **18 Claims**

1. A child restraining device for mounting in a vehicle comprising:

a child seat having a seat support upon which the child may sit and back support against which the child may rest against;

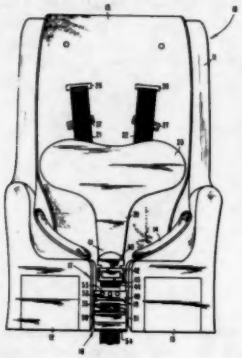
a harness movably mounted to said child seat and including a front restraining portion positionable in front of the child with first lock means mounted on said front restraining portion, said harness including a belt affixed thereto being located beneath said seat support with said belt extending forwardly through said seat to and in front of said seat support;

second lock means mounted to said seat in front of said seat support and engageable with said first lock means to removably secure said harness to said seat;

a belt adjustor mounted to said seat in front of said seat support with said adjustor including adjusting means frictionally receiving said belt being operable to hold said belt once said belt is pulled manually through said adjustor to tighten said harness and also being operable to release

said belt to loosen said harness upon manual operation of said adjustor; and

said adjusting means including a cam member pivotally mounted to said belt adjustor and frictionally engageable



with said belt to hold said belt and further including at least one manually operable pivot rod connected to said cam member for pivoting said cam member about the pivot axis.

4,679,853

SEAT BELT ANCHORAGE

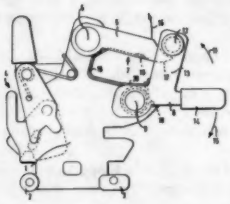
Bjorn Emanuelson, Vargarda, Sweden, assignor to Autoliv Development AB, Vargarda, Sweden

Filed Dec. 2, 1985, Ser. No. 803,805

Claims priority, application United Kingdom, Dec. 3, 1984, 8430468

Int. Cl.[4] B60R *21/02*

U.S. Cl. 297—468 21 Claims



1. A seat belt anchorage installed in a motor vehicle, comprising a support member mounted adjacent a door of the vehicle, a first member, means for connecting the first member to the support member, the said first member being adapted to have part of the seat belt secured thereto or retained thereby, and a second member movably connected to the support member, having an initial position in which it engages the first member to retain the first member in a latched position in which it is secured to the support member, thus effectively connecting said part of the seat belt secured thereto or retained thereby to the support member, the second member being movable to a second position in which it releases the first member, thus permitting the said part of the seat belt to be disengaged from the support member.

4,679,854

VEHICLE SEAT

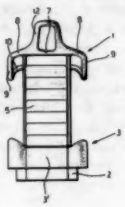
Peter-Ulrich Putsch, Rockenhausen, and Heinz P. Cremer, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,629

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511216

Int. Cl.[4] B60R *21/00*

U.S. Cl. 297—486 12 Claims



1. A vehicle seat having a back rest including an upholstery support comprising two arms provided on said upholstery support and extending from said upholstery support so as to be positioned over the right and left shoulder, respectively of a vehicle seat user from behind the vehicle user when said user is seated in said vehicle seat wherein each of said arms is connected to a side restraint member that laterally overlaps the shoulder of the vehicle user, wherein each of said arms is formed together with the associated side restraint as a structural unit, and wherein said arms are positioned only above the shoulders of the vehicle user when said user is seated in said vehicle seat.

4,679,855

SIDE SUPPORT ASSEMBLY

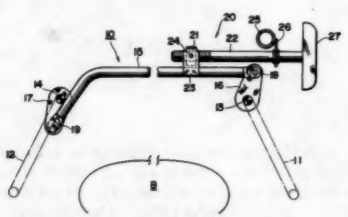
Takemi Hattori, Kariya, and Reiki Kawamura, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Dec. 27, 1985, Ser. No. 813,821

Claims priority, application Japan, Dec. 27, 1984, 59-196197

Int. Cl.[4] B60R *21/10*; A47C *31/00*

U.S. Cl. 297—486 9 Claims



1. An occupant side support assembly for a seat having a backrest, comprising:

left and right frames horizontally swingable and provided on the left and right sides of the backrest, each frame constituting a side support framework;

connecting rod means provided on the backrest and extending transversely thereof for swinging said left and right frames toward and away from each other; and

a locking mechanism provided on said connecting rod for simultaneously locking said left and right frames at a position to which they have been set.

4,679,856

MINE SELF-ADVANCING ROOF SUPPORT AND METHOD OF RELOCATING A MINE WINNING FACE EQUIPPED WITH SELF-ADVANCING ROOF SUPPORT

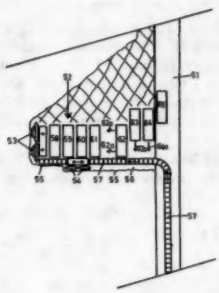
Walter Lubojatsky, Recklinghausen; Hans Lachner, Herne, and Gerald Seebacher, Recklinghausen, all of Fed. Rep. of Germany, assignors to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,872

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334004; Aug. 4, 1984, 3428854

Int. Cl.[4] E21D *15/44, 23/00*

U.S. Cl. 299—11 **15 Claims**



1. A method of relocating a winning face by means of a self-advancing roof support system by installing a new winning face at the head side of the roof support system and which includes a plurality of self-advancing roof support frames having a defined configuration, a plurality of advancing means acting perpendicular to the breast of the working for advancing said plurality of self-advancing roof support frames in the direction of the breast of the working, each of which is associated with one of said roof support frames, a plurality of additional advancing means each of which is associated with one of said roof support frames, acting parallel to the breast of the working, which means cooperate to successively advance the self-advancing roof support frames sideways parallel to the breast of the working, comprising the steps of:

extending a cut for installing the new winning face in the longitudinal direction of the winning face at the head side of the face equipment and widening the cut by the width of a support frame; and

advancing the self-advancing roof support into said cut by migrating said supports sideways parallel to the breast of the working while maintaining their configuration.

4,679,857

MOUNTING FRAME FOR LINEAR IMPACT RIPPER ASSEMBLY

Michael A. Roussin, Peoria; Jerry D. Fidler, East Peoria, and Brian D. Jensen, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 765,732, Aug. 13, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,681

Int. Cl.[4] E21C *37/20*

U.S. Cl. 299—37 **10 Claims**

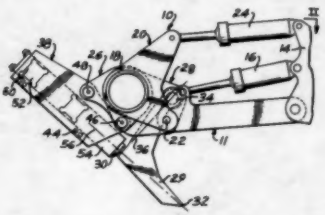
1. A mounting frame adapted for supporting an impact ripper on a vehicle providing an elevationally adjustable support frame having a pair of rearwardly extended transversely spaced legs, said impact ripper including a ripper shank for engaging the ground and an impactor, comprising:

a main crossbeam having laterally spaced opposite ends;

a pair of end plates mounted on each end of the crossbeam and forwardly extended therefrom for pivotal connection to said legs of the support frame;

a pair of impactor mounting plates mounted on said crossbeam in inwardly spaced relation from each of said pairs of end plates and rearwardly downwardly extended from the crossbeam in trailing relation thereto;

a pair of ripper shank mounting plates mounted on said crossbeam between said pair of impactor mounting plates



in forwardly extended relation from the crossbeam between said legs of the support frame; and

a shank pivot mounting on said shank mounting plates and adapted for supporting the ripper shank in depending relation therefrom.

4,679,858

MINING MACHINE CUTTER PICK INSERT

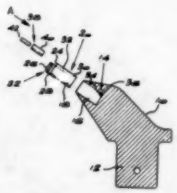
Klaus Tank, Essexwold, South Africa, assignor to DeBeers Industrial Diamond Division (Propietary), Johannesburg, South Africa

Filed Jan. 29, 1985, Ser. No. 696,050

Claims priority, application South Africa, Jan. 31, 1984, 84/0716

Int. Cl.[4] E21C *35/18;* **E21B** *10/46*

U.S. Cl. 299—91 **7 Claims**



1. A cutting tool for a mining machine, comprising:

a holding lug including a socket, and a first groove a communication with and extending outward from the socket;

a cylindrical pin located in the socket, and including an outside cutting surface, and a second groove aligned with the first groove and extending inward from a side of the pin, said first and second grooves being located opposite each other and forming a locking bore; and

means securing the pin in the socket, and including

(i) a low temperature non-metallic adhesive or soft solder, applied at a low temperature to the pin and to the surfaces of the lug forming the socket to bond the pin to the lug, and

(ii) insert means extending into the locking bore in contact with the holding lug and the pin, to restrain the pin against rotational movement in the socket, the insert means having (a) an axially extending locking sleeve including an axial through bore, and (b) an expansion pin driven into the axial through bore of the locking sleeve, and expanding the sleeve radially outward into a tight pressure engagement with the holding lug and the cylindrical pin.

4,679,859

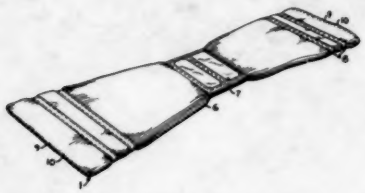
METHOD OF MAKING MOPS AND MATS IMPREGNATED WITH ANTIMICROBIAL COMPOUNDS

Charles G. Wilson, Kearney, Mo., assignor to Golden Star, Inc., North Kansas City, Mo.

Filed Oct. 28, 1985, Ser. No. 791,938

Int. Cl.[4] A47L *13/20*

U.S. Cl. 300—21 **8 Claims**



1. A mop swab having antimicrobial activity and comprising:

(a) an assemblage of yarns of cellulosic fibers;

(b) said yarns being formed into a mop swab; and

(c) said mop swab being impregnated with an organic copper salt bonded to said cellulosic fibers and having an antimicrobial activity.

4,679,860

WHEEL ASSEMBLY FOR VEHICLE

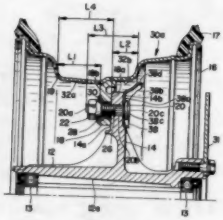
Masaru Koishi, Niiza; Haruo Shinohara, Kawagoe, and Shinji Takayanagi, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Dec. 3, 1985, Ser. No. 804,272

Claims priority, application Japan, Dec. 21, 1984, 59-194030[U]

Int. Cl.[4] B60B *3/16, 23/10*

U.S. Cl. 301—9 DN **1 Claim**



1. A wheel assembly for a vehicle comprising:

a hub including a tubular body and a radial flange formed around an outer peripheral surface of said hub body and having opposite radial faces;

(b) a separate rim including an annular body disposed coaxially with said hub body and a radial flange formed around an inner peripheral surface of said rim body and having opposite radial faces, said hub flange and said rim flange being mated together at their one radial faces,

(c) fastening means releasably connecting said hub flange and said rim flange together to fix said rim with respect to said hub, said fastening means comprising a plurality of bolts each passing through said mated rim and hub flanges in circumferentially spaced relation, and a plurality of nuts each threaded on a distal end of a respective one of said bolts, there being provided a plurality of washers each mated with and fixedly secured to the other radial face of said hub flange by said bolts passing through said washers, each washer including a base and a projection extending generally radially outwardly from said base so as to serve as said projection means; and

(d) projection means provided on said hub flange and extending generally radially outwardly of that portion of the inner peripheral surface of said rim body disposed adjacent to the other radial face of said rim flange, the distance between a radial outer end of said projection means and the one radial face of said hub flange being less than the distance between the other radial face of said rim flange and an axial outer end of said that portion remote from the other radial face of said rim flange, said projection means comprising a plurality of projections spaced circumferentially of said hub flange.

4,679,861

WHEEL COVER MOUNTING

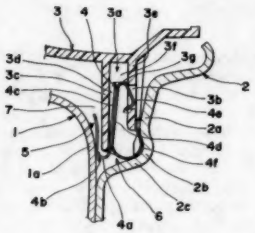
Yasuhide Narita, 4-16, Kitauchi-cho, Minami-ku, Nagoya-shi, Aichi-ken; Noboru Shirai, 104, Niho, Miya-cho, Gamagori-shi, Aichi-ken; Chihaya Kohro, Kopo Sugiura 105, 2-31, Takayashiro, Meito-ku, Nagoya-shi, Aichi-ken, and Masami Hosono, 2-53, Kounomi-cho, Nishi-ku, Nagoya-shi, Aichi-ken, all of Japan

Filed Sep. 12, 1985, Ser. No. 775,312

Claims priority, application Japan, Sep. 12, 1984, 59-138203[U]

Int. Cl.[4] B60B *7/00, 7/02*

U.S. Cl. 301—37 P **3 Claims**



1. In a wheel cover mounting which comprises a wheel cover having its back face formed with a plurality of receptacles positioned adjacent the periphery thereof, and a resilient retaining member for each receptacle inserted at one end thereof into the respective receptacle in a direction axially of the wheel, the other end of said resilient retaining member protruding outwards from the receptacle and being adapted to be press-fitted into a space which is defined between a lateral wall of a wheel disc lying generally axially of the wheel and a lateral wall of a wheel rim lying generally axially of the wheel for detachably fitting the wheel cover to the wheel, the improvement wherein said resilient retaining member is constituted by a metallic leaf spring and said outwardly protruding end has a pair of curved upturned spring catches extending in the opposite directions away from each other so as to represent a generally W-shaped configuration, one of said spring catches being adapted to resiliently engage the lateral wall of the wheel disc whereas the other of the spring catches is adapted to be inserted into and resiliently engage a hump area formed in the lateral wall of the wheel rim.

4,679,862

QUICK-RELEASE WHEELCHAIR AXLE

Chung-I Luo, No. 40, Sec. 1, Nan Ya S. Road, Pan Chiao City, Taiwan

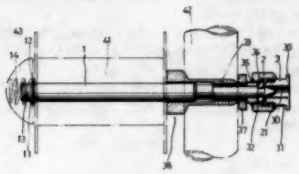
Filed Jan. 30, 1986, Ser. No. 824,195

Int. Cl.[4] B60B *27/02*

U.S. Cl. 301—112 **2 Claims**

1. A quick-release wheelchair axle comprising a coupling device which is directly incorporated into said axle of the

wheelchair wherein the male member of the coupling extends forth from one end of said axle along the axis of said axle a female member of said coupling with a receptacle running completely through it, threads forming the outer surface of the end of said female coupling oriented towards the male connector, a release ring maintained in a normally closed position by



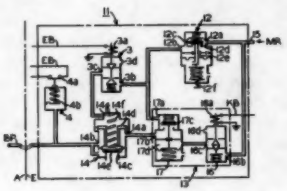
a release ring spring on the end of said female member opposite said threads, ball bearings within ball bearing slots on said female member which, in close position, are retained by said release ring, a lock ring to restrain the release ring on the end of said female coupling closest to said threads, a sleeve adjustment nut and a sleeve which may be adjusted along said sleeve adjustment threads.

4,679,863

EMERGENCY BRAKE COMMAND READ-CONVERT DEVICE FOR RAILWAY TRAIN HAVING CARS WITH PNEUMATIC AND CARS WITH ELECTRICAL BRAKE CONTROL

Mitsuhiro Ikeda, Amagasaki, and Yasuo Nakao, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 29, 1986, Ser. No. 857,693
Claims priority, application Japan, Apr. 30, 1985, 60-94090
Int. Cl.[4] B60T *13/74, 15/14*
U.S. Cl. 303—3 **12 Claims**



1. In a railway train having at least one electric brake-controlled car with an emergency brake command wire extending therethrough, at least one pneumatic brake-controlled car with a brake pipe extending therethrough, and a source of fluid under pressure, there is provided on said at least one electric brake-controlled car a read-convert device comprising:

(a) a fluid delivery path having first and second segments;

(b) pressure-regulating valve means for connecting fluid under pressure from said source to said first and second segments of said delivery path at a certain chosen value;

(c) a discharge valve having an outlet to which said brake pipe is connected, an inlet, an exhaust port, a pilot chamber, and a piston valve, said piston valve having a first position in which fluid pressure communication is established between said inlet and said outlet and is interrupted between said outlet and said exhaust port, and a second position in which fluid pressure communication is interrupted between said inlet and said outlet and is established between said outlet and said exhaust port to vent said brake pipe below said certain chosen value and accordingly produce an emergency brake application on said at least one pneumatic brake-controlled car;

(d) pilot valve means operable in response to energization of said emergency brake command wire for establishing fluid pressure communication between said first segment of said delivery path and said pilot chamber to establish said first position of said piston valve and operable in response to deenergization of said emergency brake command wire for venting said pilot chamber to establish said second position of said piston valve; and

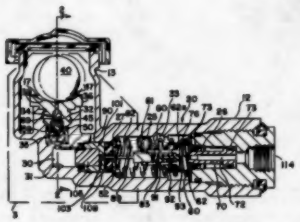
(e) cut-off means selectively operable for connecting fluid under pressure from said second segment of said delivery path to said inlet of said discharge valve in order to recharge said brake pipe to said certain chosen value when said piston valve is in said first position, and thereby effect a release of said emergency brake application on said at least one pneumatic brake-controlled car.

4,679,864

DECELERATION AND PRESSURE SENSITIVE PROPOPTIONING VALVE WITH LOW DECELERATION RESPONSIVENESS

Lawrence R. Myers; Lloyd G. Bach, both of South Bend, Ind., and Robert F. Gaiser, Stevensville, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 11, 1986, Ser. No. 850,463
Int. Cl.[4] B60T *8/28*
U.S. Cl. 303—6 C **26 Claims**



1. In a proportioning valve assembly for a vehicle having an inlet communicating with a fluid pressure source and an outlet communicating with a brake assembly, a pressure responsive assembly cooperating with the inlet and the outlet to vary fluid communication therebetween in response to pressurized fluid communicated to the inlet, an inertia sensing mass responsive to deceleration of the vehicle and cooperating with the pressure responsive assembly to assist in the variation of fluid communicated between the inlet and the outlet, a fluid-containing chamber communicating by means of a channel with the pressure responsive assembly, and first valve means disposed in said channel and engaged by said inertia sensing mass, the improvement comprising second valve means disposed in the channel and initially closed by means of said inertia sensing mass, an opening between said fluid-containing chamber and a portion of said channel, and the pressure responsive assembly having a reduced diameter end part engaging piston means of larger diameter disposed in said channel, the second valve means remaining closed and preventing communication of increased fluid pressure to the outlet until initial deceleration displaces said inertia sensing mass to effect opening of said second valve means.

4,679,865

RELAY VALVE DEVICE

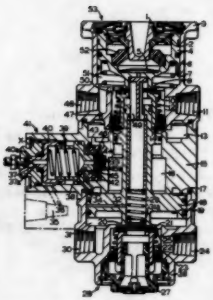
Helmut Ulrich, Springe; Peter Bartscher, Hanover, both of Fed. Rep. of Germany, and Brian Shilton, Leicestershire, England, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,661

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513292

Int. Cl.[4] B60T *15/06, 15/18;* F15B *11/02*

U.S. Cl. 303—52 14 Claims



1. A relay valve device for a pressure system which releases a pressure dependent on a control pressure from a supply source into a load circuit comprising, an intake valve linking the supply source to the load circuit, a discharge valve linking the load circuit to atmosphere, a relay piston for the actuation of the intake and discharge valves, the relay piston has a first control surface which is open to the control pressure and a second control surface, the relay piston has a reaction surface which is open to the pressure of the load circuit, the relay piston is located in such a way that it is open to the control pressure in opening direction of the intake valve and in closing direction of the discharge valve and to the pressure of the load circuit in opening direction of the discharge valve and in closing direction of the intake valve, the second control surface is open to the control pressure, a line feeding the control pressure into the second control surface and a shut-off device are controlled by the condition of a signal pressure and which is used throughout the period in which the signal pressure is present, the shut-off device includes a pressure relief valve and a switch-off device, the pressure relief valve is constructed in such a way that during a malfunction of the signal pressure, it shuts OFF the lines feeding control pressure into the second control surface when the control pressure reaches the value of the relief pressure, and the switch-off device is constructed in such a way that it switches OFF the pressure relief function of the pressure relief valve while the signal pressure is present.

4,679,866

METHOD FOR ASCERTAINING THE SET-POINT BRAKING MOMENT FOR THE VARIOUS WHEELS OF A VEHICLE

Anton van Zanten, Ditzingen; Gerhard Heess, Tamm, both of Fed. Rep. of Germany, and Hans P. Geering, Winterthur, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

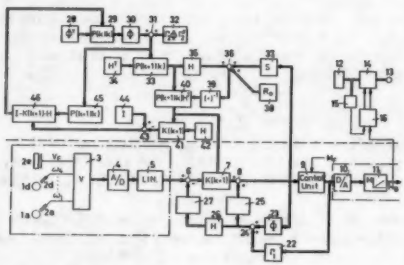
PCT No. PCT/EP84/00403, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/02590, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 15, 1984, Ser. No. 768,096

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345545

Int. Cl.[4] B60T *8/60*

U.S. Cl. 303—104 10 Claims



1. A method for ascertaining a set-point braking moment for various wheels of a vehicle, using input variables $Z(K+1)$ i, which are dependent on wheel speeds V_R of these wheels and on a vehicle speed V_F wherein i is 2−n for the variable dependent on the wheel speeds and $Z(K+1)_1$ for the variable dependent on the vehicle speed, characterized in that a Kalman filter is used in such a manner comprising the steps of

(a) forming at predetermined time intervals T, a difference between input signals $Z(K+1)_i$ and simulation values $Z(K+1)_i$ ascertained in the Kalman filter based on previous measurements;

(b) converting these differences $\tilde{Z}(K+1)_i$, by multiplication with a Kalman amplification factor K that forms a matrix, into 2n+1 difference values $\hat{X}(k+1/k+1)_i$;

(c) forming respective sums of these difference values $\hat{X}(K+1/K+1)_i$ and corresponding simulation values $\hat{X}(k+1/K)_i$;

(d) delivering these summed values $\hat{X}(K+1/K+1)_i$ to a regulator, which compares the summed values corresponding to the wheel speeds and the vehicle speed to ascertain signals MB_i corresponding to braking moments for the wheel brakes;

(e) storing in a memory the summed values, after multiplication by a transition matrix ϕ and after addition to the signals MB_i multiplied by a matrix Γ_1, as simulation values $\hat{X}(k+2/k+1)$ for the next sum formation;

(f) and storing the simulation values $\hat{X}(k+2/k+1)$, after multiplication by a measurement matrix H, in a second memory as a simulation value $Z(k+2)$ for the next measurement,

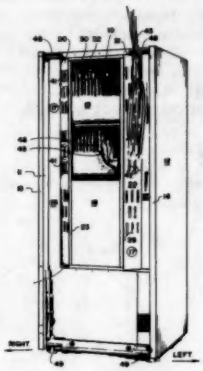
wherein the terms (k+m, and k+m/k+n) are corresponding variables used in the evaluation of different cycles wherein m and n denote the cycle number, and wherein T is the cycle time.

4,679,867

CABINET FOR AN ELECTRONIC APPARATUS

Stanley W. Heldenbrand, and Clyde L. Chappuis, both of San Jose, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1985, Ser. No. 701,285
Int. Cl.[4] A47B 81/00
U.S. Cl. 312—287 **5 Claims**



4. A cabinet for housing a telecommunication apparatus, the cabinet including left and right side walls and front and rear doors for permitting physical access to the apparatus, the apparatus including a back plane structure within the cabinet, said back plane structure being positionable in a plane normal to said side walls and intermediate said front and rear doors, the cabinet being characterized by:

left and right cable channels being defined at left and right interior corners of the cabinet by said rear door when in a closed position, said left and right side walls, respectively, and a left connector panel being angled diagonally between said left side wall and said rear door, and a right connector panel being angled diagonally between said right side wall and said rear door;

an interconnect cavity being defined by a floor member spanning an area bounded by an plane of said back plane structure, lower edges of said right and left connector panels and said rear door when in a closed position, and a ceiling member spanning an area bounded by a plane of said back plane structure, upper edges of said connector panels and said rear door when in the closed position;

wherein, when said rear door is in an open position, a periphery of a port is defined by the rearmost edges of said floor, said ceiling, and said left and right connector panels, said port being for physical access to an interior of said interconnect cavity and said back plane structure.

4,679,868

MULTICONDUCTOR ELECTRICAL CABLE TERMINATIONS AND METHODS AND APPARATUS FOR MAKING SAME

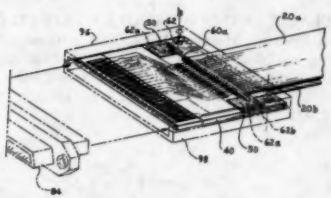
Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1985, Ser. No. 769,724
Int. Cl.[4] H01R 4/66
U.S. Cl. 439—495 **14 Claims**

1. A termination for an electrical cable having a plurality of interspersed co-planar signal and ground wires embedded in a substantially planar insulating sheath, each wire having an uninsulated end portion extending from an end portion of the insulation, comprising:

a planar circuit board substantially parallel to the plane of the cable and having a plurality of signal wire termination sites disposed in a longitudinal array on a first major surface of the circuit board, the lateral spacing between the signal wire termination sites corresponding to the lateral spacing between the signal wires in the cable, and the uninsulated end portion of each signal wire being mechanically and electrically connected to a respective one of the signal wire termination sites;

a bus member having a longitudinal mid-portion which overlies and spans the entire width of the end portion of the insulation, the uninsulated end portion of each ground



wire being mechanically and electrically connected to the bus member;

a cover overlying the first major surface of the circuit board, the signal wire termination sites, the bus member and a portion of the cable upstream from the bus member; and

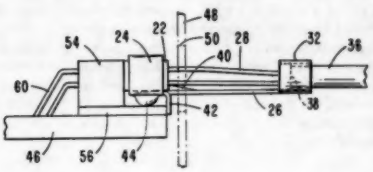
means for securing the bus member to the circuit board adjacent each end of the bus member so that the bus member clamps the end portion of the insulation against the first major surface of the circuit board with the plane of the cable parallel to the plane of the circuit board.

4,679,869

CABLE CONNECTOR HOLDER

David A. Watson, New Concord, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 18, 1986, Ser. No. 830,424
Int. Cl.[4] H01R 13/658
U.S. Cl. 439—78 **6 Claims**



1. In combination with an electrical connector having mating first and second housing members in which the first housing member is mounted on a supporting surface and includes a plurality of pin members and a second housing member which includes corresponding apertures for connection to the ends of a plurality of wires extending from a cable having a metallic sleeve surrounding the wires within the cable, a support member for the second housing member comprising;

an elongated body portion having opposed flange portions located at one end of the body portion for receiving and holding the housing member in a mounted position on the body portion;

a stop portion on the body portion for engaging one end of the housing member to hold the housing member in said mounted position;

means extending from the body portion for engaging a ground member located on the supporting surface upon

mounting of the second housing member to the first housing member;

and a pair of opposed finger portions located at one end of the body portion opposite the flange portion end and extending outwardly from said body portion to engage the cable and the metallic sleeve, said finger portions being squeezed around the cable and the sleeve to provide a strain relief on the cable and to ground the metallic sleeve upon mounting of the second housing member to the first housing member.

4,679,870

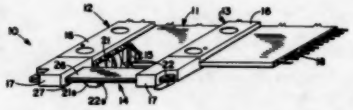
MANUFACTURE OF LOW PROFILE CLIP CONNECTOR

David A. Pretchel, Moreland Hills, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1984, Ser. No. 681,362

Int. Cl.[4] H01R *9/11, 13/504*

U.S. Cl. 439—493 12 Claims



8. In an electrical connector for an electrical device that has plural rows of electrically conductive leads, the connector including an electrical cable having plural electrical conductors, a pair of connector bodies of electrically non-conductive material molded to said cable to respective locations along its length, each connector body including therein plural electrical contacts having an exposed contact portion for engaging a lead of the electrical device and a mounting portion about which the connector body is molded and which is electrically connected at a function to a respective conductor of said cable, and resilient means for coupling said connector bodies for relative pivoting-like movement to permit attachment of said connector to the electrical device with respective ones of said electrical contacts engaged with respective leads of such device; and the improvement comprising as a part of each said connector body a respective separately molded support means of electrically non-conductive material engageable with a surface of a mold cavity for supporting said cable and said electrical contacts connected thereto in proper position with respect to the mold cavity during molding of the balance of the connector body therein, and locking means for locking said support means in the connector body upon such molding of the balance of the connector body to at least a part of each of said support means, cable and contacts to form an integral structure therewith.

4,679,871

IC PACKAGE CONNECTOR

Yoshinori Egawa, Hachiohji, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1986, Ser. No. 841,457

Claims priority, application Japan, Mar. 22, 1985, 60-41858[U]

Int. Cl.[4] H01R *23/72*

U.S. Cl. 439—70 4 Claims

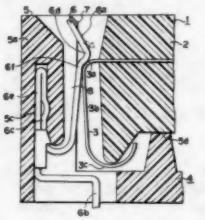
1. A connector for an IC package, the IC package having a body provided with a plurality of IC leads each of which has an arcuate shoulder part extending from a side of the body and a respective bent part extending from the shoulder part toward the bottom of the body, said connector comprising:

a connector body having a bottom wall and a peripheral sidewall extending upward from the bottom wall and around the periphery thereof to bound a compartment in which the IC package is inserted with the shoulder part of each of the IC leads projecting toward said peripheral side wall and the bent part of each of the IC leads extending from the shoulder part toward the bottom wall of said connector body, and a plurality of partition walls spaced at regular intervals along the inner periphery of said sidewall and projecting therefrom into the compartment, each of said partition walls extending between the upper end of the peripheral sidewall and said bottom wall thereby defining a plurality of contact accommodation grooves between said plurality of partition walls; and

a plurality of electrical contacts each of which extends in a respective one of said accommodation grooves,

each of said contacts comprising a planted part fixed to said connector body having an end in said respective accommodation groove that is adjacent said bottom wall and said peripheral sidewall of said connector body and having a terminal portion that is outside of said connector body and,

a flat resilient contact piece extending at one end thereof from said end of said planted part into said compartment toward the center thereof and at an angle relative to said peripheral sidewall,



said contact piece having at the other end thereof an engaging part for engaging the shoulder part of the IC lead at one location thereon when the IC package is inserted in said compartment, and another engaging part extending from said first mentioned engaging part at an angle therefrom toward the center of said compartment for engaging the shoulder part at another location spaced from said first-mentioned location when said IC package is inserted in said compartment,

said resilient contact piece being urged by the bent part of an IC lead of the IC package to deflect about said end of said planted part toward the peripheral side wall as the IC package is inserted into said compartment and to deflect under its own resiliently toward the center of said compartment after the IC package is inserted in the compartment such that said engaging parts engage the shoulder part of the IC lead at the two respective said locations thereon.

4,679,872

CYLINDRICAL BACK PLANE STRUCTURE FOR RECEIVING PRINTED CIRCUIT BOARDS

Larry D. Coe, 1957 E. Oxford, Tempe, Ariz. 85283

Filed Jan. 27, 1986, Ser. No. 822,655

Int. Cl.[4] H01R *23/70, 25/00*

U.S. Cl. 439—61 15 Claims

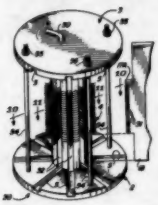
1. A back plane apparatus for receiving a plurality of electrical connectors, each having a plurality of connector connectors, the back plane apparatus comprising in combination:

(a) a plurality of conductive spider members each having a conductive hub and a plurality of narrow, elongated conductive legs extending radially outwardly therefrom;

(b) a plurality of insulative disks disposed between the respective conductive spider members and insulating each conductive spider member from the adjacent ones, the conductive spider members and insulative disks forming a vertical stack,;

(c) a plurality of printed circuit boards each having an electrical connector attached along an edge thereof, each

electrical connector having a plurality of connector conductors for electrically contacting a conductive leg of a respective one of the conductive spider members, the connector conductors of each electrical connector being arranged in pairs, the connector conductors of each pair being located side-by-side, outer portions of conductive legs of alternate conductive spider members being offset downward and sideways in one direction and outer portions of the conductive legs of the other conductive spider members being offset upward and sideways in the opposite direction, adjacent outer conductive leg portions being located side-by-side and respectively electrically



contacting the side-by-side connector conductors of a pair;

(d) means for clamping the conductive spider members and the insulative disks together in interleaved relationship to each other and maintaining the conductive legs in predetermined aligned relationship with each other; and

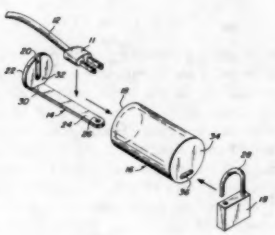
(e) a plurality of guide means for precisely guiding each of the electrical connectors as it is plugged into the back plane apparatus so that the conductive legs are precisely aligned with and make reliable electrical contact with corresponding connector conductors of respective plugged-in electrical connectors.

4,679,873

ELECTRICAL PLUG LOCK

John R. Brackett, Jr., 181 Dearborn Rd., Greenland, N.H. 03840

Filed Sep. 8, 1986, Ser. No. 906,219
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—134 **3 Claims**



1. An electrical plug lock for security purposes which comprises:

(a) a housing for containing an electrical plug having a first open end and a second closed end with a through bore in said second closed end;

(b) a closure member which cooperatively fits together with said housing for capturing said electrical plug therein, wherein said closure member has a back portion having an elongated slot for receiving the cord of an electric plug and a tongue attached at a first end projecting from said back portion and having a hole at a second end; and

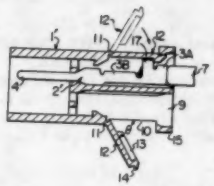
(c) means for locking said housing together with said closure member whereby the removal of said electrical plug is prevented.

4,679,874

CONNECTOR HOUSING

Eiji Saijo, and Shigekazu Wakata, both of Yokkaichi, Japan, assignors to Tokai Electric Wire Company Limited, Japan

Continuation of Ser. No. 573,405, Jan. 24, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,796
Claims priority, application Japan, Jan. 27, 1983, 58-10428[U]
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—595 **10 Claims**



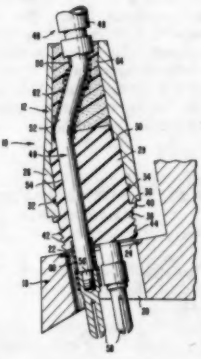
1. A connector housing adapted to contain a terminal attached to a conductor, said connector housing being defined by a pair of spaced apart sidewalls defining a cavity adapted to receive the terminal, an opening formed in a top wall bridging said sidewalls and juxtaposed to said cavity, a locking member integrally connected to said top wall by a thin hinge portion and pivotal between an opened position and a closed position in which said locking member closes said top wall opening, a bridging member extending between said sidewalls at an end of said opening spaced from said thin hinge for reinforcing said connector housing, and interlocking means on said bridging member and the cantilevered end of said locking member adapted to engage and retain said locking member in its closed position.

4,679,875

ATTACHMENT OF ELECTRIC CABLE TO SUBMERGIBLE PUMP MOTOR HEADS

Wayne H. Ramsey, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 9, 1985, Ser. No. 806,487
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—604 **15 Claims**



1. A device for attaching an end of an electric cable to the head of a motor or the like having an opening for receiving the

device, said device comprising a rigid shell with a body of elastomeric material filling an end portion of the shell and projecting therefrom to form an insert to be received in said opening, said cable having conductor means extending through said body and provided with terminal means at an end of said conductor means, said body being sealed within said shell and said conductor means being sealed within said body, said insert having an integral external peripheral bead abutting an end of said shell and having external peripheral ridge means for sealing said insert in said opening with said bead against a portion of said motor head surrounding said opening and with said terminal means positioned to engage cooperable terminal means of the motor head via said opening.

4,679,876

ELECTRICAL CONNECTOR AND AN ELECTRICAL TERMINAL

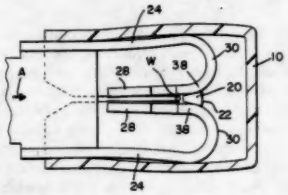
Juan Regla, and Jose Lazaro, both of Barcelona, Spain, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 24, 1986, Ser. No. 910,912

Claims priority, application United Kingdom, Sep. 30, 1985, 8524065

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—426 **10 Claims**



1. An electrical connector comprising:

an electrically insulating housing having walls defining a terminal receiving cavity, the housing having an open end and an opposite end, two opposed walls of the housing each being formed with a wire receiving slot extending from said open end towards said opposite end;

an electrical terminal provided with a pair of interconnected, superposed wire gripping plates having aligned openings therein, the terminal being insertable into the cavity through said open end to make electrical connection with a wire extending through said wire receiving slots;

means biassing said wire gripping plates resiliently against one another with opposed faces thereof in contiguous face to face relationship;

and wedge means projecting from the housing into the cavity for forcing the plates apart from each other to receive the wire between said opposed faces of the plates as the terminal is being inserted into the cavity, the wedge means and the openings in the plates being so relatively arranged that when the terminal has been inserted into the housing, the wedge means enter said openings to permit the plates to resile against the wire to grip it.

4,679,877

ELECTRIC PLUG WITH SNAP-FITTED HOUSING COMPONENTS

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Filed Jul. 17, 1985, Ser. No. 755,230

Int. Cl.[4] H01R *11/20, 13/58, 13/68*

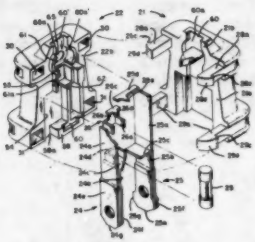
U.S. Cl. 439—425 **10 Claims**

1. An electrical plug and cord assembly comprising:

an insulated electrical cord having two separated conductors;

a plug housing which is longitudinally divided into two mating non-conductive half-shells and a wireway for an end portion of the cord having an expanded intermediate portion defined by upstanding side walls, said wireway having an entrance between the shells;

one of said shells having a non-conductive prong projecting completely through said cord between said conductors



and within said expanded portion of the wireway to resist pulling of the cord out of the wireway by pressing said conductors against said side walls;

conductive contact members in the plug housing engaging said conductors; and

means for holding said shells together.

4,679,878

INSULATION-PIERCING ELECTRICAL CONTACT AND CONNECTOR INCORPORATING THE SAME

Claus Volk, Yorktown Heights, N.Y., assignor to Stewart Stamping Corporation, Yonkers, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,477

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—425 **4 Claims**

4. A modular plug connector, such as of the type insertable into modular jacks for telephone use, for terminating a multiconductor cable comprising a plurality of elongated insulated conductors comprising:

a unipartite housing formed of dielectric material and having a forward end, a rearward end at which the cable is received and a contact-receiving side, a plurality of channels formed in said housing for receiving respective insulated conductors, each pair of adjacent channels being separated from each other by a partition wall so that the width of said channels is defined by the distance between adjacent partition walls, and a plurality of contact-receiving slots, each slot opening onto said contact-receiving side of said housing and communicating with a respective one of said conductor-receiving channels; and

a plurality of electrical contacts formed of metallic conductive material for terminating the elongated insulated conductors, each contact being received in a respective one of said contact-receiving slots and including a thin, substantially planar body portion having a pair of opposed substantially planar side surfaces defining a thickness of said body portion and a longitudinally extending top edge surface, first and seecond insulation-piercing tines integral

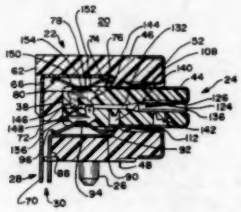
with said body portion, said tines being longitudinally spaced from each other and transversely offset with respect to each other and adapted to pierce the insulation of the elongated insulated conductor to be received in the respective one of said channels communicating with the respective one of said slots in which said contact is received, each of said tines having an inner surface adapted to electrically engage the elongated conductor of the elongated insulated conductor to be received in said respective channel, said inner surfaces of said tines lying within the thickness of said body portion and being transversely spaced from each other a distance less than the maximum transverse dimension of the elongated conductor to be received in said respective channnel, said tines terminating in bottom edges at least portions of which lie within the thickness of said body portion both before and after engagement with the elongated conductor and wherein the transverse distance between the inner surface of each tine and an opposed partition wall is less than the sum of the diameter of the conductior and the thickness of the insulation of the insulated conductor to be received in said respective channel.

4,679,879

PLUG AND RECEPTACLE CONNECTOR ASSEMBLY

Irvin R. Triner, Stickney, and Craig A. Bixler, Elmhurst, both of Ill., assignors to Molex Incorporated, Ill.

Filed Oct. 3, 1986, Ser. No. 914,892
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—425 **17 Claims**



1. An electrical plug for use with a flat insulated cable having a plurality of conductors in side-by-side spaced apart relationship, said plug comprising:

a dielectric plug housing with a first mating end and a second opposed conductor receiving end, oppositely facing plug walls, oppositely facing plug side walls, a receiving cavity disposed between said plug walls and extending from said second conductor receiving end for receiving a portion of said flat cable,

a plurality of first plug contacts disposed in said plug housing adjacent one of said plug walls, each of said first plug contacts being coupled to one of said plurality of conductors in a first set of alternate conductors,

a plurality of second plug contacts disposed in said plug housing adjacent to the other of said plug walls, each of said second plug contacts being coupled to one of said plurality of conductors in a second set of alternate conductors,

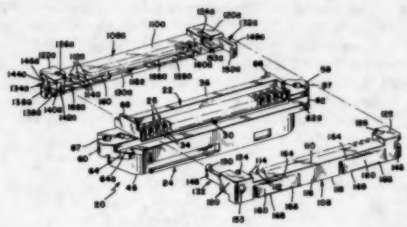
a first set of contact planes, each of said plurality of first plug contacts being included in one of said first planes, and a second set of contact planes, each of second plurality of second plug contacts being included in one of said second contact planes, adjacent contact planes in said first and second set of contact planes being offset from each other in a direction between the side walls of said plug housing.

4,679,880

STRAIN RELIEF ATTACHMENT FOR WIRE CONNECTOR ASSEMBLY

Daniel M. Pitsch, Minneapolis, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Dec. 16, 1985, Ser. No. 809,574
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 **5 Claims**



1. An electrical connector assembly comprising: a wire attaching side including a plurality of insulation displacement connectors each having a wire receiving slot sized to receive an insulation bearing conductive wire of predetermined size within said slot, each of said connectors further having electrically conductive insulation piercing members projecting into said slots and sized to pierce insulation of a wire received within said slot and conductively engage said wire;

said plurality of connectors arranged in first and second sets with axes of slots within a set parallel and linearly aligned to hold a plurality of wires within said slots with axes of said wires disposed within said slots parallel and linearly aligned;

said first and second sets disposed in parallel aligned spaced apart relation;

a pair of strain relief attachments for restraining wires held by said connectors;

means for securing said strain relief attachments to said assembly with said attachments providing strain relief for wires held by said connector;

said assembly presenting a mounting surface sized to abut a first surface of a mounting bracket having an opening sized for said wire attaching side to extend through said opening with said mounting surface abutting said first surface;

said attachments each having locking members on sides thereof to protrude beyond said opening and presenting a locking surface opposing a second surface of said mounting bracket, said locking surface disposed in a plane spaced from said mounting surface a distance approximate to a distance between said first surface and said second surface; said locking member disposed for said mounting bracket to be captured between said lock surface and said mounting surface when said assembly is disposed with said wire attaching side extending through said opening and said mounting surface abutting said first surface; and

said lock members flexible to be urged toward said wire receiving side.

4,679,881

ELECTRICAL INTERCONNECTION APPARATUS AND TECHNIQUE

Aaron A. Galvin, Lexington; Hugh D. Dyer, Norton, and Kenneth J. Leff, Halifax, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,672
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—392 **8 Claims**

1. For use in providing a series electrical connection be-

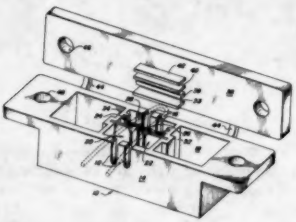
tween a conductor and an electrical unit, apparatus comprising:

means having a pair of spaced walls, each of the walls including first and second slots in alignment with corresponding first and second slots of the other wall;

a first insulation displacement (IDC) connector having a groove aligned with and positioned between said first slot and said corresponding first slot;

a second insulation displacement (IDC) connector electrically separate from the first connector and having a groove aligned with and positioned between said second slot and said corresponding second slot;

said grooves of said first and second connectors each adapted to engage a conductor such that said conductor and said connector are an electrical communication;



a knife blade spaced between the insulation displacement connectors and one of the housing walls and having an upper knife edge confronting the corresponding first and second slots;

the slots of the walls and connector grooves defining a path along which said conductor can be looped, with the loop end of the conductor extending outside one wall adjacent to the knife blade;

means for coupling each of said connectors to a respective terminal of an electrical unit;

cover means operative to be secured over the walls and including means operative to force said conductor disposed in the slots of the walls into the grooves of the IDC connectors and also operative to force the conductor against the knife blade to sever the loop end of the conductor at positions adjacent the corresponding first and second slots.

4,679,882

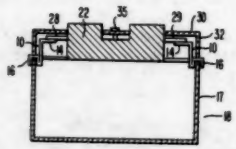
SUPPORT CLIPS FOR SUPPORTING ELECTRICAL FIXTURES IN A JUNCTION BOX

Larry E. Mears, P.O. Box 6548, Lake Worth, Fla. 33461

Filed Sep. 17, 1985, Ser. No. 777,055

Int. Cl.[4] H02B *1/02*

U.S. Cl. 439—569 **12 Claims**



1. Apparatus for supporting an electrical fixture in a junction box, comprising:

an electrical fixture having a first end and a second end, a top portion, a first mounting bracket at said first end and a second mounting bracket at said second end, and an aperture in the center of said top for reception of a mounting screw;

a junction box having four walls;

a junction box cover having at least a top and at least one aperture in said top for reception of a mounting screw, whereby said electrical fixture may be mounted to said cover solely with a mounting screw through said aperture in said top of said cover and said aperture in said top of said fixture, and whereby said first and second mounting brackets are unsecured to the junction box cover;

means for secure said junction box cover to said junction box;

at least a first clip including:

a lower end having means to secure the clip to the junction box; and

an upper end having means to support and engage one of said unsecured fixture mounting brackets, whereby said clip supports said one of said unsecured fixture mounting brackets when said junction box cover is secured to said junction box.

4,679,883

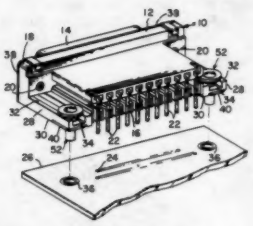
SHOULDER EYELET BOARD LOCK

John E. Assini, and Paula A. Kissinger, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 8, 1986, Ser. No. 904,315

Int. Cl.[4] H01R *4/66, 13/648*

U.S. Cl. 439—607 **7 Claims**



1. An electrical connector assembly for mounting to a printed circuit board, comprising:

a dielectric housing having a first integral flange having mounting face, an opposed holding face and a hole extending therebetween;

an eyelet disposed in said hole, said eyelet having end flange means engaging the mounting face and holding face with a generally cylindrical shank extending therebetween; and

a rivet disposed in the eyelet comprising flange means and a generally tubular shank, the generally tubular shank having a first section within the eyelet including means for providing an interference fit between the rivet and the eyelet and a second section extending beyond the eyelet for securing the assembly to the printed circuit board, whereby the housing, eyelet and rivet form an assembly for mounting in preformed holes in the printed circuit board.

4,679,884

FUSED ELECTRICAL PLUG

Eldon J. Klemp, Mayer, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 7, 1986, Ser. No. 860,440

Int. Cl.[4] H01R *13/68*

U.S. Cl. 439—106 **11 Claims**

1. A fused electrical appliance plug including at least neutral and positive terminal posts and further comprising:

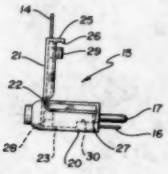
a first plug portion from which said neutral terminal post extends along an axis parallel to the principal axis of said first plug body portion, said first plug body portion including a cavity for receiving a fuse;

a second plug body portion from which said positive terminal post extends;

hinge means securing said first and second plug body portions for pivotal relative movement between an open position wherein said fuse receiving cavity is accessible and a closed position wherein said fuse receiving cavity is inaccessible;

means for

(i) mechanically positively retaining a fuse on said second plug body portion while said second body portion is in said open position, and



(ii) establishing an electrical connection through said fuse in said cavity between a cord conductor and said positive terminal post only when said first and second plug body portions are in said closed position and along an axis parallel to the principal axis of said first plug body portion; and

means for releasably securing said first and second plug body portions in said closed position

wherein the initial pivoting movement upon opening said first and second plug body portions is substantially perpendicular to the axis of said positive terminal post.

4,679,885

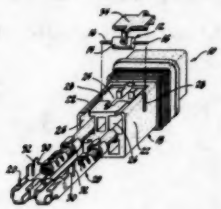
ELECTRICAL COMPONENT PACKAGING ASSEMBLY

Charles R. Nestor, Niles; Raymond A. Maga, Poland, and Gregory L. Bensing, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1986, Ser. No. 891,994

Int. Cl.[4] H01R *13/42, 13/66*

U.S. Cl. 439—620 **3 Claims**



1. A package assembly for packaging an electrical component having a lead and for electrically connecting said component lead to a terminal so as to cooperatively mechanically lock said terminal to said package assembly, comprising,

a housing having a cavity for receiving said component and a first slot sized so that said component lead may be closely fitted therewithin, said housing also having a terminal receiving passage adjacent and generally orthogonal to said first slot, and,

a terminal having a second slot sized so that said component lead may be closely fitted therewithin and located so as to generally align with said first slot when said terminal is received in said passage, whereby, after said terminal has been so received, said component may then be received in said cavity and said component lead closely fitted within said first and second aligned slots, thereby electrically connecting said component lead to said terminal and simultaneously mechanically locking said terminal against withdrawal from said passage.

4,679,886

MULTI-WIRE CONTACT ASSEMBLY

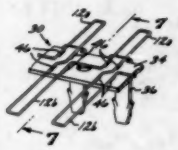
William H. King, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Division of Ser. No. 754,382, Jul. 11, 1985, Pat. No. 4,631,824.

This application Dec. 12, 1986, Ser. No. 940,819

Int. Cl.[4] H01R *13/05*

U.S. Cl. 439—816 **6 Claims**



1. A contact assembly for an electronic component, comprising:

a conductive pin having a shank portion and a tab portion formed at an angle to said shank portion; and

first and second elongate wire loops each having a first end conductively connected to said tab portion and a second, closed, end extending away from the juncture between said tab portion and said shank portion so as to be resiliently cantilevered, said first and second loops each having a pair of legs extending between said first and second ends thereof, one of the legs of said first loop being interposed between the legs of said second loop, and one of the legs of said second loop being interposed between the legs of said first loop.

4,679,887

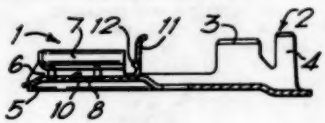
ELECTRICAL TERMINAL

Charles L. Jackson, Nr. Tonbridge, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 24, 1982, Ser. No. 361,295

Int. Cl.[4] H01R *11/22*

U.S. Cl. 439—849 **3 Claims**



1. An electrical terminal for mating with a flat tab male terminal and having a receptacle portion comprising a base and a pair of opposed side walls upstanding from the base, free edge portions of the side walls being turned-in over the base whereby the base, side walls and free edge portions together define a passage to receive from one end a flat tab male terminal, there being an integrally formed tongue extending from the tab-entry end of the base and within the receptacle portion, the tongue having a projection arranged to engage in a hole in a male tab when mated with the terminal to lock the male tab to the terminal, a free end portion of the tongue projecting away from the base to provide a release member by depression of which towards the base the projection on the tongue can be released from the hole in the male tab to allow disconnection, the release member being formed with a projection directed

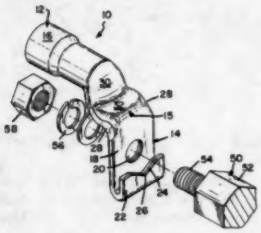
towards the tab entry end of the receptacle portion and positioned such that the leading end of a male tab being mated with the terminal will engage the release member between the root of the tongue and the projection, the projection serving to prevent movement of the free end of the male tab along the release member towards the free end thereof and thus limit insertion of the male tab into the receptacle portion.

4,679,888

ELECTRICAL TERMINAL AND A METHOD OF MAKING IT

Tom R. Williams, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 5, 1982, Ser. No. 345,956
Int. Cl.[4] H01R *4/30*
U.S. Cl. 439—883 **1 Claim**



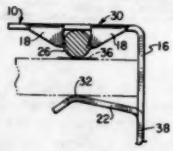
1. A stamped and formed electrical terminal comprising an elongated length of tubing with one end providing a cylindrical wire receiving means and the other end being flattened and bent ninety degrees relative to the wire receiving means and having an opening therethru to receive an electrical stud and further with the free end being V-shaped and bent back to face the opening, said V-shaped free end adapted to cooperate with a hexagonal-headed stud which may be positioned in the opening to prevent the terminal from rotating about the stud.

4,679,889

SOLDER-BEARING LEADS

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, College Point, N.Y.

Continuation-in-part of Ser. No. 737,830, May 24, 1985, Pat. No. 4,605,278. This application Oct. 31, 1985, Ser. No. 793,654
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—876 **12 Claims**



1. A solder-bearing lead adapted to be soldered to a conductive surface, comprising:

an elongated strip-like body portion,

said body portion having on at least one edge thereof a pair of spaced laterally extending tabs defining an opening therebetween,

said pair of tabs being bent substantially perpendicular from the body portion strip to form therebetween part of a channel with said body portion forming a floor for said channel,

a solder mass in said channel and bordered by said pair of tabs,

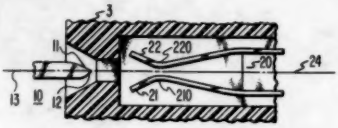
said tabs being bent inwardly of said channel to retain said solder mass therein.

4,679,890

CONNECTOR CONTACT TERMINAL

Solomon S. Fineblum, Randolph, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 624,345, Jun. 25, 1984, abandoned.
This application Oct. 21, 1985, Ser. No. 788,529
Int. Cl.[4] H01R *3/00*
U.S. Cl. 439—884 **7 Claims**



1. A male pin for engaging a pair of opposing female blades each formed with an arcuate section bowed inwardly toward a central axis to engage the pin comprising:

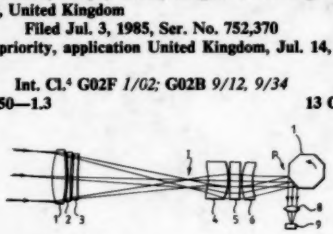
a pin member with an end thereof having a pair of curvilinear surfaces each corresponding with one of said female blades for engagement therewith with one curvilinear surface formed to extend from the central axis at the pin end at a first radius and the other curvilinear surface opposite said one curvilinear surface formed to extend from the pin end central axis at a second radius less than said first radius for generating a sequential deflection force on the blades as said pin member is inserted along the central axis between the pair of female blade arcuate sections.

4,679,891

INFRA-RED LENSES

Michael Roberts, Clwyd, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Jul. 3, 1985, Ser. No. 752,370
Claims priority, application United Kingdom, Jul. 14, 1984, 8417993
Int. Cl.[4] G02F *1/02*; G02B *9/12, 9/34*
U.S. Cl. 350—1.3 **13 Claims**



1. An infra-red lens having a group of at least three closely spaced lens elements, the group being of positive overall power and the three lens elements being of three different respective infra-red transmitting materials each having a positive thermal coefficient of refractive index, the group comprising a pair of lens elements of materials whose refractive indices are relatively temperature insensitive, the pair consisting of a positively powered lens element and a negatively powered lens element arranged to effect substantial achromatisation and substantial correction of spherical aberration, and the group having a further negatively powered lens element of a material whose refractive index is relatively temperature sensitive and is of lower dispersion and higher refractive index than the materials of the said pair of elements, said further negatively powered lens element being arranged to effect substantial athermalisation.

4,679,892
COMPONENT FOR AN INTEGRATED OPTICAL SYSTEM

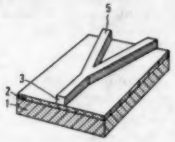
Jan Haisma; Pieter van der Werf, both of Eindhoven; John M. Robertson, deceased, late of Eindhoven, and by Freidrich J. de Haan, administrator, Dommelen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,109

Claims priority, application Netherlands, Oct. 7, 1983, 8303446

Int. Cl.[4] G02B 6/12

U.S. Cl. 350—96.12 **8 Claims**



1. A component for an integrated optical system for guiding visible or infrared electromagnetic radiation, said component comprising:

a monocrystalline substrate of a material having a garnet structure and a refractive index n_1, said substrate not being a waveguide;

a dielectric layer having a refractive layer n_2 grown epitaxially directly on the substrate, n_2 being smaller than n_1; and

an optical waveguide layer having a refractive index n_3 grown epitaxially directly on the dielectric layer, n_3 being greater than n_2.

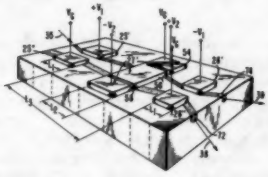
4,679,893
HIGH SWITCHING FREQUENCY OPTICAL WAVEGUIDE SWITCH, MODULATOR, AND FILTER DEVICES

O. Glenn Ramer, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 527,149, Aug. 26, 1983. This application Apr. 14, 1986, Ser. No. 852,081

Int. Cl.[4] G02B 6/10

U.S. Cl. 350—96.14 **17 Claims**



1. An electro-optical device comprising:

(a) an electro-optic substrate;

(b) first and second optical channel waveguides provided at a surface of said substrate, said waveguides being generally parallel to one another, optically coupled in first and third regions of said device, and essentially optically isolated from one another in an interposed second region; and

(c) first, second, and third sets of electrodes associated with said waveguides in said first, second, and third regions, respectively, of said device, said first and third electrode sets being biased so as to effectively transfer light energy between said first and second waveguides, said second electrode set being selectively biased so as to provide a proportionally corresponding relative phase difference in the light energy traveling in each of said waveguides such that light energy introduced into said first waveguide is effectively transferred in part to said second waveguide within said first region and such that light energy is effectively transferred between said first and second waveguides in said third region, the transfer taking place in a direction and at a magnitude directly dependent on said correspoding relative phase difference between light energy traveling in said second region of said device.

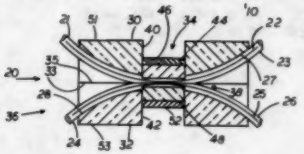
4,679,894
ELECTRICALLY SWITCHED FIBER OPTIC DIRECTIONAL COUPLER

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 20, 1984, Ser. No. 642,215

Int. Cl.[4] G02B 6/26

U.S. Cl. 350—96.15 **21 Claims**



1. A switchable fiber optic directional coupler for selectively coupling optical signals between a first optical fiber having a first core, a first cladding and a first propagation constant and a second optical fiber having a second core, a second cladding and a second propagation constant comprising:

means for forming an interaction region in which the evanescent field of light propagating in each of said optical fibers interacts with the other of said optical fibers;

control means for interacting with the evanescent fields of light propagating in said optical fibers to control the propagation constants of the fibers and thereby control the coupling of light between said optical fibers, said control means including;

a first block of an interaction material placed adjacent said interaction region;

a second block of an interaction material placed adjacent said interaction region, the first and second blocks cooperating to increase one of the first and second propagation constants while decreasing the other; and

means for applying an electric field to said first and second blocks to control the relative magnitude of first and second propagation constants.

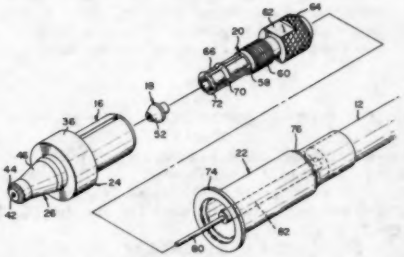
4,679,895
ADHESIVELESS OPTICAL FIBER CONNECTOR

John H. Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1984, Ser. No. 645,976

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **7 Claims**



1. A connector for an optical fiber comprises a ferrule for surrounding the fiber, a clamp of resiliently compressible material for surrounding the fiber, and a body for connection to the ferrule, the body having a tubular portion divided into fingers for gripping a buffer jacket surrounding the fiber, character-

ized in that, a portion of the clamp is surrounded by the fingers, and another portion of the clamp is in the ferrule and is urged by the fingers against an internal surface of the ferrule that deforms the clamp radially to grip the fiber, and the fingers are in the ferrule and are urged by the internal surface to compress radially against the buffer jacket.

4,679,896

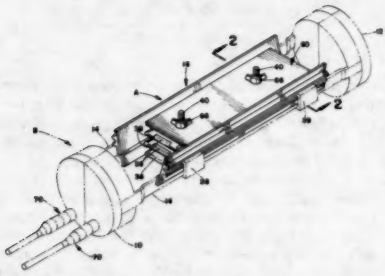
OPTICAL FIBER SPLICE ORGANIZER

Joseph T. Krafcik, Seven Hills; Richard J. Barnes, Mentor, and Erwin H. Goetter, Chesterland, all of Ohio, assignors to Preformed Line Products Company, Cleveland, Ohio

Filed Sep. 27, 1985, Ser. No. 781,108

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **8 Claims**



1. An organizing tray assembly for optical fiber splices comprising:

(a) an elongated, generally channel shaped open ended main frame member including a longitudinally extending bottom wall and a pair of spaced upwardly extending integral side walls;

(b) a pair of threaded support members extending vertically upwardly from said bottom wall at longitudinally spaced location generally midway between said side walls;

(c) a plurality of generally rectangular tray members each including a base having spaced longitudinal edges and defining a support surface having a width less than the distance between said side walls, each base having openings through which said support members extend to maintain said tray members generally midway between said side walls in juxtaposed relationship; and,

(d) spacer means for maintaining said tray members in a predetermined, vertically spaced relationship on said threaded support members, said spacer means comprising upwardly extending bosses formed on said bases about said openings and flanges extending upwardly and inwardly from said longitudinal edges, the height of said bosses and said flanges being substantially equal.

4,679,897

OPTICAL FIBRE ELEMENT FOR USE IN AN OPTICAL CABLE

Stephen P. Driskel, Astley, England, assignor to BICC Public Limited Company, London, England

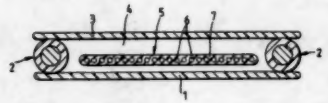
Filed Jun. 18, 1985, Ser. No. 745,929

Claims priority, application United Kingdom, Jun. 22, 1984, 8415999

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **10 Claims**

1. An optical fibre element comprising a tape of plastics material having two oppositely disposed major surfaces and having transversely spaced on and secured to one of its major surfaces at least two plastics insulated electric conductors extending lengthwise of the tape; a second tape of plastics material having two oppositely disposed major surfaces, which second tape overlies the transversely spaced plastics insulated electric conductors with one of its major surfaces secured thereto to form between adjacent pair of plastics insulated conductors an elongate compartment; and, loosely housed in the elongate compartment, at least one optical fibre ribbon comprising a plurality of optical fibres arranged side by side



and embedded in an elongate body of plastics material, the diameters of the plastics insulated electric conductors each being substantially greater than the smaller transverse dimension of the optical fibre ribbon and the transverse distance between said pair of plastics insulated electric conductors being substantially greater than the larger transverse dimension of the optical fibre ribbon.

4,679,898

SIGNAL TRANSMISSION CABLE

Albertus T. M. Grooten, Waddinxveen, Netherlands, assignor to N.K.F. Groep B.V., Rijswijk, Netherlands

Filed Sep. 16, 1985, Ser. No. 776,328

Claims priority, application Netherlands, Sep. 18, 1984, 8402858

Int. Cl.[4] H01B *7/22, 11/22*

U.S. Cl. 350—96.23 **2 Claims**

1. A signal transmission cable having a cable core of optical and/or electric conductors enveloped by a gas-tight and liquid-tight sheath, said sheath comprising, in the direction outwardly from said core, an overlapped layer of a metal tape of a thickness of at least 100 μm of aluminum or copper, a layer of a synthetic resin adhering to the surface of said metal tape remote from said core, and surrounding said metal tape, a layer of high-density polyethylene adhering to, and surrounding said synthetic resin layer, a layer of polyamide-11 or polyamide-12 provided on and surrounding said layer of polyethylene, an armoring of reinforcing wires or reinforcing tapes surrounding said layer of said polyamide and an outer sheath formed of a synthetic resin surrounding said armoring.

4,679,899

OPTICAL FIBER

Toshiaki Kobayashi; Kazuo Sanada; Toshiaki Murayama, all of Chiba; Yasuyuki Sugawara, Sakura, and Naoshi Uesugi, Mito, all of Japan, assignors to Fujikura Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,574

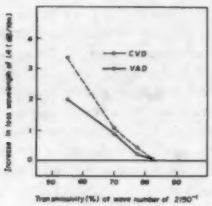
Claims priority, application Japan, Mar. 1, 1984, 59-39184

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.30 **6 Claims**

1. An optical fiber of a silica-based material having a coating of cured silicone rubber covering an outer surface thereof, said cured silicone rubber coating, when subjected to an infrared

spectroscopic measurement, having a transmissivity of not less than 70% at a wave number of 2100 to 2200 cm^{-1} at a coating



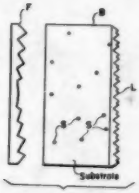
thickness of 0.1 mm due to the infrared absorption due to the stretching and vibration of SiH.

4,679,900

BULK DIFFUSER FOR A PROJECTION TELEVISION SCREEN

Thomas S. McKechnie, Ossining, and Jill F. Goldenberg, Pelham Manor, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,009
Int. Cl.[4] G03B *21/60*
U.S. Cl. 350—126 **7 Claims**



1. A bulk diffuser for a rear projection television screen comprising:

a substrate having a first index of refraction; and

a plurality of spheres dispersed through said substrate, said spheres having a second index of refraction which is different from said first index of refraction, a range of diameters of said spheres and a loading density of said spheres being chosen such that a resulting intensity half-angle and an energy half-angle are substantially equal whereby an intensity profile of said bulk diffuser is Gaussian.

4,679,901

COMPOUND OPTICAL PHASE GRATING AND OPTICAL SWITCH

Hans Dammann, Tangstedt, and Heinrich Kurz, Pinneberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 574,775, Jan. 27, 1984, Pat. No. 4,585,307. This application Nov. 21, 1985, Ser. No. 800,576
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303623
Int. Cl.[4] G02B *5/18, 6/34*
U.S. Cl. 350—162.2 **5 Claims**

1. An optical switch comprising:

a first optical port;

a plurality of second optical ports; and

a light-deflecting element for optically connecting the first port to one of the second ports;

characterized in that:

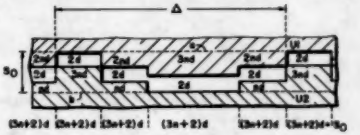
the light-deflecting element comprises a compound optical phase grating capable of switchably diffracting light into several central diffraction orders;

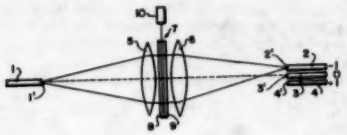
the second ports are positioned at the central diffraction orders; and

the compound optical phase grating comprises:

a substantially planar first grating section having parallel grooves, having a grating period, and having a grating profile which is repeated once each grating period; and

a substantially planar second grating section having parallel grooves, having a grating period equal to the grating period of the first grating section, and having a grating profile which is repeated once each grating period, said second grating section being arranged opposite and parallel to the first grating section with the grooves in the first





grating section parallel to the grooves in the second grating section, the first and second grating sections being movable relative to each other in their planes in a direction perpendicular to the grooves;

wherein:

each grating profile is at least substantially parabolic;

each grating profile is symmetrical about the center of each grating period; and

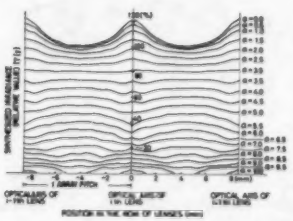
when the first and second grating sections are both arranged symmetrically about a common line perpendicular to the grating, the compound grating has an optical path length therethrough which is uniform across the grating.

4,679,902

IMAGE FORMING OPTICAL APPARATUS

Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 525,723, Aug. 23, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,794
Claims priority, application Japan, Aug. 23, 1982, 57-145978
Int. Cl.[4] G02B *27/00*; G03B *27/52, 27/70*
U.S. Cl. 350—167 **3 Claims**



1. An optical imaging system for projecting light images from an object surface toward an image surface, said imaging system including a plurality of optical devices comprising a roof mirror lens array, said roof mirror lens array comprising a lens array and a roof mirror array which are fabricated by

precise plastic molding and are integrally elongated, said roof mirror lens array being disposed between the object surface and the image surface, wherein

an irradiance distribution at the imaging surface of said roof mirror lens array is given by:

$$L_T(y) = C \sum_{i=1}^{N} \left[\int_{x1}^{x2} V_i([y-(i-1)p)^2 + x^2]^{\frac{1}{2}} x \frac{Z^4}{[(y-(i-1)p)^2 + x^2 + z^2]^2} dx \right]$$

where

$L_T(y)$: irradiance distribution at the imaging surface of the roof mirror lens array

$V_i(\ )$: aperture efficiency at the position on the imaging surface

p: array pitch of the i'th single lens system

x: position perpendicular to the array in the image surface

y: position parallel to the array in the image surface;

i: the i'th lens of the roof mirror lens array;

and

the irradiance unevenness for scanning ΔL_T is determined by:

$$\Delta L_T = \frac{L_T \max - L_T \min}{L_T \max}$$

where L_T max and L_T min, respectively, indicate the maximum and minimum of the irradiance distribution $L_T(y)$,

a slit being provided having the slit position (x_1, x_2) and slit width x_1, x_2 so that said $L_T(y)$ is made to be maximum and said ΔL_T is made to be minimum.

4,679,903

OBJECTIVE LENS DRIVING DEVICE

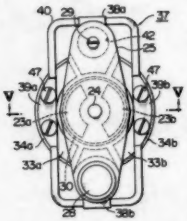
Akihiro Kasahara, Tokyo; Kenya Goto; Akira Yamada, both of Yokohama, and Shoji Watanabe, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 26, 1984, Ser. No. 687,002

Claims priority, application Japan, Dec. 27, 1983, 58-246306

Int. Cl.[4] G02B 7/04; F16F 7/12, 15/12

U.S. Cl. 350—247 **12 Claims**



1. An object lens driving device comprising:

a base;

a shaft vertically extending from a central portion of said base;

a movable member supporting an objective lens;

bearing means for supporting said movable member to be rotatable around and slidable along said vertical shaft;

electromagnetic driving means for rotating and shifting said movable member around and along said shaft;

a coil bobbin provided on said movable member to extend concentrically with said bearing means for supporting coil means of said electromagnetic driving means; and

means including a damper member provided between said movable member and predetermined stationary portions of the objective lens driving device, said damper member being formed into an annular configuration so as to surround said movable member to be symmetric around a central axis of said bearing means for accurately damping both rotational and sliding movements and repositioning to a neutral position of said movable member supporting the objective lens, said damper member being connected along the circumference thereof with movable-side connecting members and stationary-side positioning members secured to said movable member and the predetermined stationary portions of the objective lens driving device, respectively.

4,679,904

LENS DRIVING DEVICE FOR AN OPTICAL PICKUP UNIT WITH SIMPLIFIED CONSTRUCTION

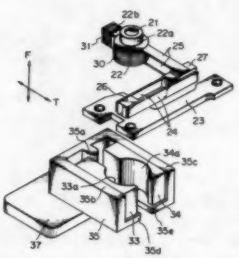
Toshihiko Kurihara, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,597

Claims priority, application Japan, Apr. 23, 1984, 59-059718[U]

Int. Cl.[4] G02B 7/08, 7/02

U.S. Cl. 350—255 **3 Claims**



1. A lens driving device for an optical pickup unit, comprising:

an objective lens for focusing a light beam on a recording surface of a recording medium;

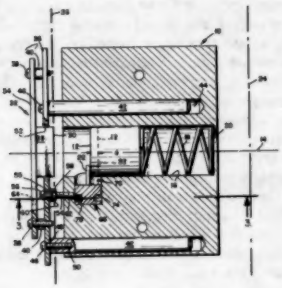
a support means for supporting said objective lens so that an optical axis of the objective lens is perpendicular to the surface of the recording medium, and movements of the objective lens in a direction of said optical axis and in a direction perpendicular to the optical axis independently are allowed; and

a driving means for driving said objective lens in said direction of said optical axis and in said direction perpendicular to the optical axis, wherein said driving means includes a first coil connected to said objective lens and arranged so that a central axis thereof is substantially parallel to said optical axis, a second coil also connected to said objective lens and arranged so that a central axis thereof is substantially normal to the optical axis, and a magnetic circuit arranged to surround said first and second coils, and to form a single magnetic gap in which said first and second coils are received, for producing interlinkage magnetic flux crossing said first and second coils, thereby producing driving forces for moving said objective lens in the direction of said optical axis and in the direction perpendicular to the optical axis independently when suitable driving currents are supplied to said first and second coils respectively.

4,679,905
LINEAR ADJUSTMENT APPARATUS

Dwight G. Westover, Sierra Madre, Calif., assignor to Bell & Howell Company, Skokie, Ill.

Filed Aug. 2, 1985, Ser. No. 762,198
Int. Cl.[4] G02B 7/04; F16H 25/18
U.S. Cl. 350—255 13 Claims



1. Image focus adjustable apparatus, comprising in combination:

an optics block;

an optical image generating device having an optical axis and slidably mounted in said housing along said optical axis;

a rotary member rotatably mounted in said optics block about an axis perpendicular to said optical axis and having an eccentric engageable with said optical device for displacing said optical device along said optical axis when said rotary member is rotatably displaced and said eccentric is engaged with said optical device;

restraining means carried by said optics block for restraining displacement of said rotary member along said rotary member axis;

biasing means carried by said optics block for biasing said optical device to engage said eccentric;

linearly positionable means carried by said optics block and adjustably positionable along a line perpendicular to said rotary member axis and displaced therefrom;

lever means carried by said rotary member and adapted for contact with said linearly positionable means such that said rotary member is rotatably displaced when said linearly positionable means is linearly repositioned;

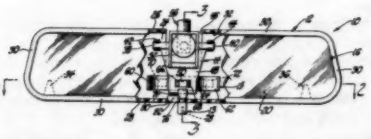
image receiving means for receiving an image generated by said image generating means; and

adjustable support means carried by the optics block for supporting said image receiving means and for adjusting position thereof along said optical axis.

4,679,906
ANTI-GLARE REAR VIEW MIRROR

Darrell L. Brandenburg, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1985, Ser. No. 808,727
Int. Cl.[4] B60R 1/04
U.S. Cl. 350—281 4 Claims

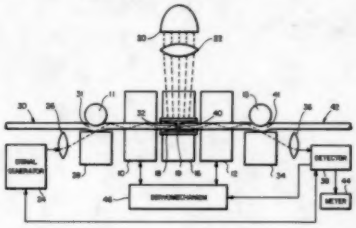


1. An anti-glare rear view mirror adapted to be mounted on a windshield, said mirror comprising a housing supporting a mirror element having two reflecting surfaces of different reflecting powers, said housing including a back wall integrally formed with forwardly extending top and bottom walls so as to define a chamber with said back wall, said back wall having an opening formed therein, a pair of bearing members projecting outwardly from said back wall into said chamber and located on opposite sides of said back wall opening adjacent said top wall, a keyhole shaped opening formed in said bottom wall, a pair of pad members formed on said back wall in said chamber adjacent said bottom wall, a pivot plate member located in said chamber and having a ball support mounted therein at the upper end thereof for connection with said windshield through said opening formed in said back wall, said pivot plate member including a pair of laterally extending cylindrical pivot shaft members respectively snapped into and received within said pair of bearing members, a spring member carried by the lower end of said pivot plate member for engaging said pad members, and an actuator member located in said keyhole shaped opening for rotation about a vertical axis and having a cam member engaging said lower end of said pivot plate member against the continuous bias of said spring member so as to selectively present one or the other of said reflecting surfaces to a viewer.

4,679,907
METHODS, APPARATUS AND ARTICLES FOR OPTICAL FIBER SYSTEMS

Bruce D. Campbell, Portola Valley; James T. Triplett, Livermore, and Richard E. Tylor, Fremont, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Division of Ser. No. 437,053, Oct. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 370,321, Apr., 1982, abandoned, which is a continuation-in-part of Ser. No. 258,079, Apr. 27, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 602,242
Int. Cl.[4] G02B 6/24
U.S. Cl. 350—320 42 Claims



1. A method of withdrawing an optical signal from a core of an optical fiber, the fiber comprising the core, a cladding, and a buffer, comprising the steps of:

bending a portion of the optical fiber about a bend radius sufficiently small such that core light can be withdrawn from the fiber core at the bent fiber portion by using an optical coupler, the buffer having a refractive index greater than the cladding;

withdrawing part of the optical signal from the optical fiber core through the buffer and into the optical coupler at the bent fiber portion and;

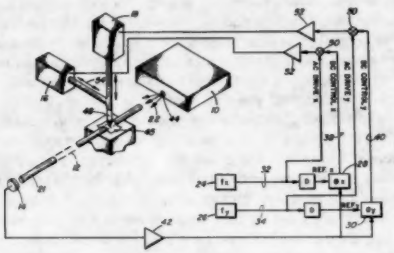
detecting the withdrawn optical signal part.

4,679,908

LASER-FIBER POSITIONING METHOD

John C. Goodwin, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 12, 1985, Ser. No. 797,328
Claims priority, application Canada, Jun. 28, 1985, 486031
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—320 6 Claims



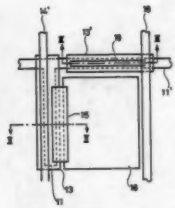
1. A method of anchoring a fiber to a substrate comprising:
attaching a positioner to the fiber using a meltable material so that the positioner is separated from the fiber by said meltable material;
moving the positioner to position the fiber in a desired position on the substrate so that the meltable material and a part of the fiber, but not the positioner are in contact with a bead of curable material which in turn is in contact with the substrate;
continuously monitoring the position of the fiber and maintaining the fiber in said desired position as the curable material cures and anchors the fiber to the substrate; and
when the curable material is cured, melting said meltable material and withdrawing the positioner.

4,679,909

LIQUID CRYSTAL INPUT/OUTPUT MATRIX PANEL

Hiroshi Hamada; Fumiaki Funada, both of Yamatokoriyama, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 744,961
Claims priority, application Japan, Jun. 20, 1984, 59-128023
Int. Cl.[4] G06F 3/02
U.S. Cl. 350—333 8 Claims



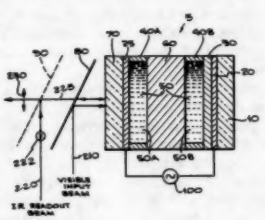
1. An information input/output system comprising:
an information matrix display panel including,
a plurality of common gate lines arranged in parallel with each other;
a plurality of common data write lines arranged in parallel with each other and perpendicular to said common gate lines;
a plurality of common data read-out lines in parallel with said data write lines and dispersed therebetween;
a plurality of picture display elements each disposed between a common data write line and a common date read out line and between successive common gate lines, a gate portion of each common gate line extending along an edge of said picture display element perpendicular to said common gate line, said gate portion extending across substantially the entire length of said picture display element;
a semiconductor region forming a channel between said gate portion and a common data write line;
a drain electrode formed over a part of said semiconductor region and an edge of said picture display element;
a light detection layer formed over a region of each said common gate line adjacent to said picture display element and perpendicular to said data read out line;
a transparent conductive film formed over said light detection layer and connected to said data read out line,
said gate portion, semiconducor region, common data write line and drain electrode forming switching means of each said picture display element for applying an output voltage thereto for the display of information on said element,
said light detection layer, transparent conductive film and data readout line forming a photoelectric translation cell of each said picture display element for detecting light patterns inputted to said display panel.

4,679,910

DUAL LIQUID-CRYSTAL CELL-BASED VISIBLE-TO-INFRARED DYNAMIC IMAGE CONVERTER

Uzi Efron, Los Angeles, and Bernard H. Soffer, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 20, 1985, Ser. No. 714,145
Int. Cl.[4] G02F 1/135
U.S. Cl. 350—335 22 Claims



1. A visible to infrared dynamic image converter light valve comprising:
first and second liquid crystal means for spatially modulating an incident infrared beam by polarization rotation;
means for applying a voltage across said first and second liquid crystal means, said polarization rotation in said first and second light crystal means being responsive to said applied voltage;
photoconductor means, disposed between said first and second liquid crystal means, for receiving a visible wavelength image and for spatially modulating said voltage applied across said first and second liquid crystal means responsively to said image to vary said polarization rotation, said photoconductor means being absorptive of visible wavelength radiation and transparent to infrared radiation;
mirror means, disposed adjacent said second liquid crystal means, for reflecting said infrared beam back through said first and second liquid crystal means, whereby said infrared beam passes through said first and second liquid crystal means twice and is polarization rotated in proportion to said visual wavelength image; and
polarization means, disposed adjacent said first liquid crystal means, for converting said polarization rotation of said

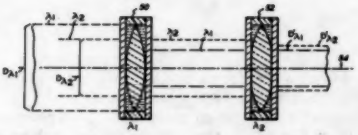
infrared beam to output intensity modulation to produce an infrared image.

4,679,911

OPTICAL APPARATUS USING LIQUID CRYSTALS FOR SHAPING THE SPATIAL INTENSITY OF OPTICAL BEAMS HAVING DESIGNATED WAVELENGTHS

Stephen D. Jacobs, Pittsford, and Kathleen A. Cerqua, Rochester, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,678
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—347 E 16 Claims



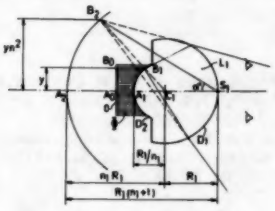
1. Apparatus for shaping the profile of an optical beam of given wavelength which is directed along a path, which comprises first and second bodies of cholesteric liquid crystal material having opposite chirality about said path and disposed successively along said path, each of said bodies having a surface transverse to said path which is curved so that the thickness of each of said bodies along said path varies in the direction transverse to said path.

4,679,912

BINOCULAR EYEPIECE

Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,275
Claims priority, application France, Nov. 10, 1982, 82 18920
Int. Cl.[4] G02B *25/04*
U.S. Cl. 350—410 7 Claims



1. A wide-field eyepiece for viewing an object surface plane, comprising a biconvex thick lens made of a material having an index n_1, having first and second concentric spherical lens surfaces, each having a respective radius, a line through the common center of said lens surfaces, forming an optical axis of the system,

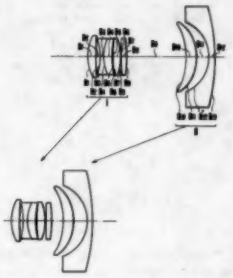
said lens being arranged such that the second lens surface faces the object plane, and has a radius equal to the quotient of the radius of the first lens surface and the index n_1, and means for forming a magnified virtual image of the object on a spherical surface which is concentric with said lens surfaces and has a radius equal to the product of the radius of the first lens surface and the index n_1, said virtual image and the image formed on the second lens surface satisfying the aplanatic condition.

4,679,913

VARI-FOCAL OBJECTIVE LENS OF SHORT TOTAL LENGTH

Yasuhisa Sato, Kanagawa; Yasuyuki Yamada, Tokyo; Hiroki Nakayama, and Kouji Oizumu, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jun. 28, 1985, Ser. No. 750,698
Claims priority, application Japan, Jul. 2, 1984, 59-137019
Int. Cl.[4] G02B *15/00, 13/18*
U.S. Cl. 350—423 10 Claims



1. An objective lens comprising a front lens unit and a rear lens unit with a separation between said two lens unit being varied to vary the focal length of the entire system,

said front lens unit having a positive refractive power and consisting of, from front to rear, a positive lens of strong convex curvature toward the front, a negative doublet lens of negative and positive elements cemented together, and a positive lens sub-unit; and

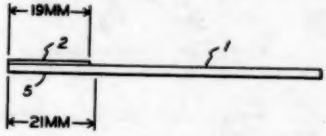
said rear lens unit having a negative refractive power and having a positive lens and a negative lens.

4,679,914

MICROSCOPE SLIDE WITH TOP AND BOTTOM MARKING SURFACES

H. James Rosenberg, Wellesley, Mass., assignor to Erie Scientific Company, Portsmouth, N.H.

Continuation of Ser. No. 775,704, Sep. 13, 1985, abandoned, which is a continuation of Ser. No. 617,400, Jun. 5, 1985, abandoned. This application Jun. 2, 1986, Ser. No. 871,144
Int. Cl.[4] G02B *21/34*
U.S. Cl. 350—534 10 Claims



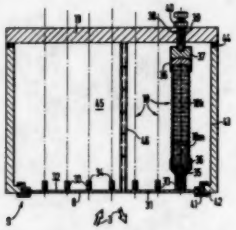
1. A microscope slide having a top and bottom surface, said top surface having at least one opaque marking surface located at one end of said slide formed by a coating of a resinous material having a permanent matte finish for accepting a marking, said resinous material including a granular medium, said bottom surface having a frosted surface substantially behind said first marking surface for providing a second marking surface.

4,679,915

DEFORMABLE MIRROR

Helmut Kriz, and Hansjorg Stadler, both of Rückersdorf, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,064
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502025
Int. Cl.[4] G02B 5/08, 7/18
U.S. Cl. 350—611 14 Claims



1. A deformable mirror, particularly designed to compensate for the influences of atmospheric interference on the propagation or spread of high-energy laser beams, comprising a mirror body having a front thin mirror plate with a mirror surface on the front of the mirror plate and a rear surface on the rear of the mirror plate, and rear surface having a plurality of trunnions formed thereon for coaxial connection to a plurality of electrically-actuatable adjusting elements engageable with said trunnions and pressed against said trunnions and the rear surface of the mirror plate, and further wherein a sleeve connects each said trunnion with an associated electrically-actuable adjusting element which is supported thereagainst and is encompassed by the sleeve.

4,679,916

OPTICAL VIEWING APPARATUS WITH TWO MIRRORS CONSECUTIVELY REFLECTING THE LINE OF SIGHT

Robert A. Roller, 226 Day St., Tallahassee, Fla. 32304, and Warren L. Roller, 873 Ashwood Dr., Wooster, Ohio 44691

Filed Mar. 5, 1986, Ser. No. 836,293
Int. Cl.[4] G02B 23/08, 17/06, 7/18
U.S. Cl. 350—623 11 Claims

1. An optical viewing apparatus adapted to be worn on the head of a wearer which comprises:

a frame adapted to be worn by a wearer about the eyes; and

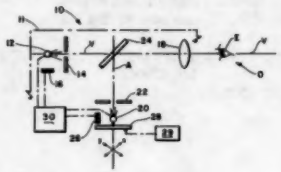
a first mirror and a second mirror both of which are mounted to said frame in a spaced-apart relationship, wherein one of said mirrors is positioned above the normal line of sight and closer to the face than the other of said mirrors, said mirrors being oriented such that the wearer can view objects at a distance in the horizontal plane in front of the wearer when the head is in a downwardly looking position with the normal line of sight substantially in the vertical plane.

4,679,917

DEVICE FOR MEASURING INTRAOCULAR LIGHT SCATTER

Louis V. Genco, Enon, and Harry L. Task, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1985, Ser. No. 726,568
Int. Cl.[4] A61B 3/10, 3/02
U.S. Cl. 351—221 16 Claims



1. An optical system for measuring intraocular light scatter in the vision system of a subject, comprising:

a. a first glare source of light and a and second point source of light of respective preselected intensities, said first glare source being of intensity greater than said second point source whereby intraocular haze is generated by said first glare source in said vision system of said subject;

b. first optical means for projecting an image of said first glare source along a first optical axis into said vision system of said subject;

c. second optical means for projecting an image of said second point source along a second optical axis intersecting said first optical axis;

d. means for optically superimposing said image of said second point source onto said image of said first glare source for projection therewith along said first optical axis into said vision system of said subject;

e. means connected to said second point source for moving said second point source in a plane substantially perpendicular to said second optical axis, whereby said image of said second point source as viewed by said subject is selectively movable with respect to said image of said first glare source; and

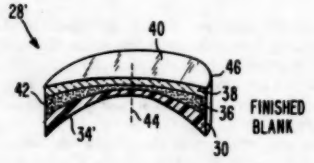
f. measurement means for gauging the observed circumferential extent of said haze in contrast to said image of said second point source.

4,679,918

OPHTHALMIC GLASS/PLASTIC LAMINATED LENS HAVING PHOTOCHROMIC CHARACTERISTICS AND ASSEMBLY THEREOF

Ronald S. Ace, 5200 J. Philadelphia Way, Lanham, Md. 20706

Filed Oct. 23, 1984, Ser. No. 663,914
Int. Cl.[4] G02C 7/02, 7/10
U.S. Cl. 351—163 46 Claims



1. A glass and plastic composite ophthalmic lens comprising:

a frontmost glass lens layer having a glass front surface and a glass ocular surface, said ocular surface having a first radius of curvature, said glass layer having a first coefficient of thermal expansion;

a plastic lens layer concentric with said glass layer and

having a plastic front surface and a plastic ocular surface, said plastic front surface having a second radius of curvature and being adjacent but spaced from said glass layer ocular surface to define a narrow gap therebetween, said plastic layer having a second coefficient of thermal expansion; and

an optically clear, highly cohesive and adhesive elastomeric bonding material having low tensile strength, and capable of elongation greater than 100% without destruction or permanent deformation within said gap after curing to bond said glass layer to said plastic layer, said adhesive layer having a thickness at the periphery of said gap which is determined by the difference between said first and second coefficients of thermal expansion, by the diameter of the lens, and by the maximum elongation of said elastomeric bonding material so that the elasticity of said bonding material will accommodate changes in the dimensions of said plastic layer with respect to said glass layer due to said difference between said coefficients of thermal expansion over an ambient temperature range of about 300° F. to prevent delamination of and to prevent fracture of said glass and plastic layers.

4,679,919

OPHTHALMIC PHOTOGRAPHIC APPARATUS

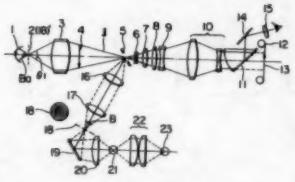
Yuji Itoh, Chigasaki, and Junichi Takahashi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 589,740, Mar. 15, 1984, abandoned. This application Jul. 15, 1986, Ser. No. 884,305

Claims priority, application Japan, Mar. 22, 1983, 58-48095

Int. Cl.⁴ A61B *3/14*; G03B *29/00*

U.S. Cl. 351—206 **4 Claims**



1. An opthalmic photographing apparatus having:

photographing means for photographing the fundus of an eye to be examined at a variable magnification;

a ring slit having an outside diameter provided in an illuminating optical path for illuminating the fundus of the eye at a position substantially conjugate with the front-eye-part; and

means for varying the slit width of a ring slit image projected onto the eye to be examined, with a magnification change such that the outside diameter of the ring slit image is not varied.

4,679,920

AUTOMATIC PERIMETER

Shioiri Takashi, Wako; Kobayashi Katsuhiko, Chiba, and Tago Hideo, Matsudo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

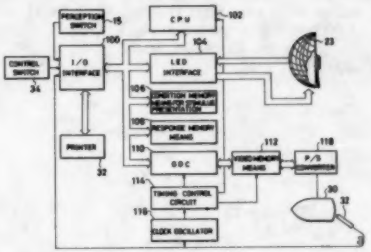
Filed Feb. 20, 1985, Ser. No. 703,317

Claims priority, application Japan, Feb. 24, 1984, 59-33754; Mar. 16, 1984, 59-50702

Int. Cl.⁴ A61B *3/02*

U.S. Cl. 351—226 **6 Claims**

1. An automatic perimeter comprising stimulus presentation means for presenting stimuli to a patient, presentation condition memory means for memorizing a plurality of presentation conditions, control means for controlling the stimulus presentation means so as to present the stimuli in accordance with the presention conditions memorized in the presentation condition memory means, response means operated by the patient for supplying perception signals responding to presented stimuli, response signal memory means for memorizing the perception signals in relation to the presentation condition thereof, output means for supplying output of the perception signals memorized in the response signal memory means, first input means for applying a plurality of first command signals to the control



means, second input means adapted to cooperate with said first input means to supply second command signals which are to be applied to the control means, and function change means for changing the command signals generated by the second input means in response to the stimulus presentation condition controlled by the control means.

4,679,921

APPARATUS FOR EYE EXAMINATION

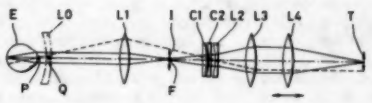
Kenji Yamada, Narashino, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,072

Claims priority, application Japan, May 26, 1984, 59-107308

Int. Cl.⁴ A61B *3/02, 3/10*

U.S. Cl. 351—222 **7 Claims**



1. An eye examining apparatus for examining the eye of an examinee by letting the examinee look at a target with an examined eye in a specified position to determine the optical characteristics of spectacles needed by the examinee, said apparatus comprising:

(a) a first positive lens unit:

(b) a negative lens unit;

(c) a second positive lens unit;

(d) a third positive lens unit movable along an optical axis, said first positive lens unit, negative lens unit, second positive lens unit and third positive lens unit being arranged between the examined eye and the target in the named order from the side of the examined eye, the focal point on the eye side of the composite system composed of said negative lens unit and said second and third positive lens units being approximately coincident with the position conjugated with the pupil of the examined eye relative to said first positive lens unit; and

(e) an astigmatic system disposed approximately conjugate, relative to said first positive lens unit, with the position at which spectacles should be located if the examinee wore the spectacles with the examined eye being in said specified position, said astigmatic system including two astigmatic lenses rotatable about the optical axis, one of said two astigmatic lenses being a positive cylindrical lens and the other of said two astigmatic lenses being a negative

cylindrical lens, and wherein said negative lens unit and said second and third positive lens units form an image of the target at a position in the vicinity of the focal point on the target side of said first positive lens unit.

4,679,922

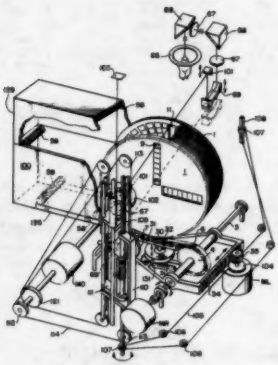
RETRIEVING IMAGES STORED ON WINDOWED DISCS

John C. Nelson, 4013 Linden St., Oakland, Calif. 94608

Filed Aug. 3, 1984, Ser. No. 637,584

Int. Cl.[4] G03B *23/06*

U.S. Cl. 353—25 **34 Claims**



1. An apparatus for random access retrieval of micrographic and data images stored along radii of stacked windowed discs, each disc having a closed perimeter and a radially disposed clear window, said apparatus comprising: means for supporting a stack of discs at the perimeter thereof; a selection means for addressing a particular disc carrying desired information while the disc remains in the stack; an optical system comprising projecting means at one end of a stack of discs for projecting a light along an optical axis to an image receiving means at the opposite end of the stack; means for radially moving said optical system thereby moving said optical axis; and means for rotating the disc to a position wherein the selected image is in the optical axis of said system.

4,679,923

PROTECTING DEVICE FOR TRANSPARENCIES

Bjarne M. Nielsen, Nordre Frihavnsgade 65, st.th., DK-2100 Copenhagen O., Denmark

Continuation of Ser. No. 495,602, May 18, 1983, Pat. No. 4,548,487. This application Jul. 31, 1985, Ser. No. 760,828

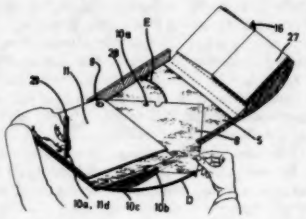
Claims priority, application Denmark, May 21, 1982, 2307/82

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[4] G03B *21/54*

U.S. Cl. 353—120 **13 Claims**

1. A protecting device for transparencies comprising: an unfoldable file having a bottom cover which forms a frame having a transparent window therein, said file having a pair of side members attached to opposed edges of said bottom cover, at least one of said members being hinged to said bottom cover; a swivel pin mounted on said frame and extending perpendicularly to said frame; a swivel cover mounted on said pin for pivotal movement between a position overlying and parallel to said window when said file is folded and a position offset from and inclined to said window and overlying one of said one side members when said file is in unfolded condition, said one side member being arranged to form a support for said swivel cover and the transparencies therein; in the unfolded condition, and the other side member counterbalancing said swivel cover and transparencies, said swivel cover being adapted to receive within it a plurality of transparencies to be pivotably mounted on said pin for independent pivotal movement about said pin into and out of said swivel cover so that when said swivel cover overlies said one side member in a file-unfolded condi-



tion, each transparency can be selectively pivoted between a position overlying said window and a position within said swivel cover; and a stop member on said bottom cover for stopping pivotal movement of each transparency when such transparency overlies said window.

4,679,924

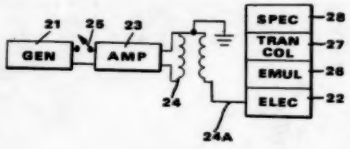
CORONA DISCHARGE PHOTOGRAPHY

Allen W. Wamsley, 21829 Oakwood, East Detroit, Mich. 48021

Filed Jun. 26, 1986, Ser. No. 878,588

Int. Cl.[4] G03B *41/00*; H01T *19/00*

U.S. Cl. 354—3 **14 Claims**



1. In an improved corona discharge photography means for photographing a speciman which utilizes a pulse generator, amplifier means, an electrode and a photographic recording medium, the improvement comprising a transmittance column disposed between the electrode and said speciman, said column being filled with an image-carrying solution to transmit corona discharge from an electrode to said speciman, said corona discharge occurring back and forth through said image-carrying solution to expose said photographic recording medium, said exposure occurring in part by transmittance column reflection.

4,679,925

CAMERA

Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,783

Claims priority, application Japan, Feb. 10, 1985, 60-24196; Feb. 10, 1985, 60-24197

Int. Cl.[4] G03B *1/18*

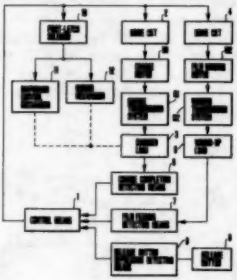
U.S. Cl. 354—173.1 **14 Claims**

1. A camera capable of both single frame and continuous shootings, comprising:

(a) first detecting means for detecting the state of said single frame shooting and the state of said continuous shooting;

(b) charging means for performing a charging operation;

(c) second detecting means for detecting the termination of the charging operation by said charging means;
(d) film transporting means for transporting film to make a next exposure;
(e) third detecting means for detecting the completion of a one-frame advancing operation of said film transporting means; and
(f) control means for controlling the sequence of release operation of said camera, said control means, when said single-frame shooting state is detected by said first detect-



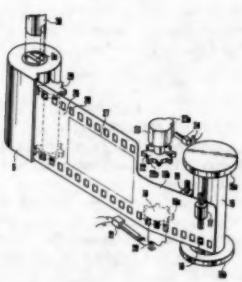
ing means, enabling the release operation for a next exposure after the completion of the charging operation has been detected by said second detecting means and the completion of the film transporting operation has been detected by said third detecting means, and when said continuous shooting state is detected by said first detecting means, initiating part of the release operation prior to the shutter opening at a time when the completion of the charging operation is detected by said second detecting means.

4,679,926

MOTOR DRIVEN FILM REWIND DEVICE FOR CAMERA

Nobuyuki Suzuki, Kanagawa, and Masami Shimizu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 646,631, Aug. 31, 1984, abandoned.
This application Feb. 19, 1986, Ser. No. 831,108
Claims priority, application Japan, Sep. 1, 1983, 58-159052
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.11 **17 Claims**



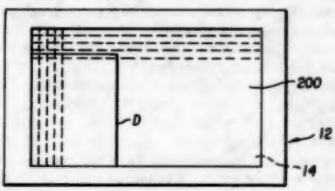
1. A motor-driven film rewinding device for a camera, comprising:
(a) film rewinding means for rewinding a coil of film wound up on a film take-up spool of the camera;
(b) film movement detecting means for producing a signal which shifts alternately between a first state and a second state as the film moves:
(c) timer means, arranged to be reset according to the shift of the signal produced from said film movement detecting means, for producing a signal upon completion of a time measuring operation carried out for a predetermined period of time, said timer means including
a timer circuit which performs a time measurement from the start of an operation of said film rewinding means for a short period of time when the signal of said film movement detecting means shifts and for a long period of time when said signal does not shift; and
(d) control means for rendering said film rewinding means inoperative according to said signal produced from said timer means.

4,679,927

IMAGE FORMING APPARATUS

Toshiyuki Sogo, Ebina, and Fumito Ide, Zama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1985, Ser. No. 775,040
Claims priority, application Japan, Sep. 29, 1984, 59-204441; Sep. 29, 1984, 59-204484; Sep. 29, 1984, 59-204486
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



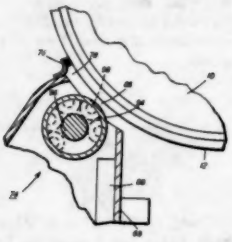
1. An image forming apparatus, wherein an electrostatic latent image is formed on a photosensitive body by a process of electrical charge and image exposure and a reproduced image is formed by the development of the electrostatic latent image, comprising:
(a) a main body;
(b) a transparent glass provided at the top of said main body for holding a document;
(c) image area designating means mounted directly on the upper surface on said transparent glass for designating a required copy area of the document, which includes,
(i) first transparent electrode sheet means having a plurality of conductive members arrayed on it in rows in one direction, and
(ii) second transparent electrode sheet means provided opposite said first electrode sheet and having a plurality of conductive members arrayed on it in rows at right angles to the conductive members of said first transparent electrode sheet,
wherein said image area designating means generates electrical signals from electrical contact points corresponding to the required copy area designated by pressing said first transparent electrode sheet so that the conductive members of first and second transparent electrode sheets electrically contact each other;
(d) memory means for storing the electrical signals generating by said image area designating means; and
(e) image formation preventing means for preventing the formation of an electrostatic latent image on said photosensitive body other than in the area to be copied, according to the electrial signals read from said memory means.

4,679,928

DEVELOPMENT APPARATUS

Mark A. Massie, Glendora, and Christopher C. Rhodes, Claremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1985, Ser. No. 744,442
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD 14 Claims



1. An apparatus for developing an electrostatic latent image recorded on a moving photoconductive member in a development zone, including:

means, having the exterior surface thereof substantially smooth, for moving developer material into contact with the photoconductive member in the development zone, said moving means moving at a greater velocity than the photoconductive member with a portion of the developer material moving at substantially the same velocity as the photoconductive member and another portion of the developer material moving at substantially the same velocity as said moving means so that shearing of the developer material occurs; and

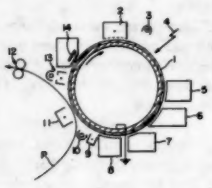
means for collecting the developer material moving at a velocity less than the velocity of said moving means in the region of the entrance to the development zone resulting in an extension of the development zone.

4,679,929

MULTIPLEX IMAGE REPRODUCING APPARATUS

Satoshi Haneda; Hisashi Shoji, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 656,582, Oct. 1, 1984, Pat. No. 4,599,285. This application May 29, 1986, Ser. No. 868,020
Claims priority, application Japan, Oct. 3, 1983, 58-183152; Oct. 4, 1983, 58-184381; Oct. 7, 1983, 58-187000; Oct. 7, 1983, 58-187001; Dec. 17, 1983, 58-238295; Dec. 17, 1983, 58-238296; Jan. 26, 1984, 59-13167
Int. Cl.[4] G03G *13/08*
U.S. Cl. 355—4 35 Claims



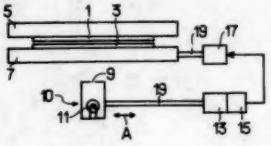
1. An apparatus for reproducing multiplex images comprising an image retainer having thereon an electrostatic image retaining layer, means for forming an electrostatic image on said image retainer, means for developing the electrostatic image formed on the image retainer to form a toner image, an oscillating electric field applied between the image retainer and a developer feeding carrier to develop said electrostatic images, means for superposing a plurality of toner images on the image retainer, and means for transferring the toner images onto a recording paper in one step.

4,679,930

ONE-WAY REDUCING AND ENLARGING PRINTER

Fumihiko Nishida; Yasumasa Shimizu, both of Kyoto; Tomohiro Yoshida, Neyagawa; Makoto Urata, Kyoto; Tomiji Hotta, Kyoto; Masaji Mizuta, Uji, and Hiroshi Yamashita, Toyonaka, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 22, 1985, Ser. No. 726,072
Claims priority, application Japan, May 25, 1984, 59-107137; Feb. 25, 1985, 60-037212
Int. Cl.[4] G03B *27/68*
U.S. Cl. 355—52 7 Claims



1. A one-way reducing and enlarging printer comprising:

a holder for holding a photosensitive material;

a light transmissive negative holder provided under said photosensitie material holder so as to hold a negative opposite to the photosensitive material;

a light source provided so as to be movable under said negative holder;

a douser having a slit opening and being provided between said light source and the negative, said douser being movable together with said light source;

a first driving motor for moving said douser;

a second driving motor for moving either one of said photosensitive material holder and said negative holder, said photosensitive material holder and said negative holder being movable relative to one another;

signal generating means attached to said first driving motor for generating a signal;

means for controlling the relative motion between said photosensitive material holder and said negative holder based upon said signals from said signal generating means; and

means for blowing air directly onto a back surface of the photosensitive material so as to bring the photosensitive material into contact with the negative.

4,679,931

ELECTROPHOTOGRAPHIC APPARATUS

Tetsuo Sueda, Chofu; Mitsuhiro Tokuhara, Chigasaki, and Takeshi Baba, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 753,523, Jul. 10, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,168
Claims priority, application Japan, Dec. 7, 1984, 59-143296
Int. Cl.[4] G03B *27/34, 27/40*
U.S. Cl. 355—56 8 Claims

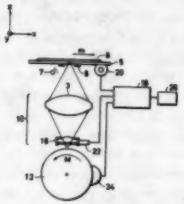
1. An electrophotographic apparatus having:

illuminating means for illuminating an original;

scanning means for scanning the original;

imaging means for imaging the reflected light or the transmitted light from the original on a light-receiving member, said imaging means having at least one variable refractive power element the refractive power of which is varied by varying at least one of the refractive index and the shape thereof;

control means for varying at least one of the refractive index and shape of said variable refractive power element; and



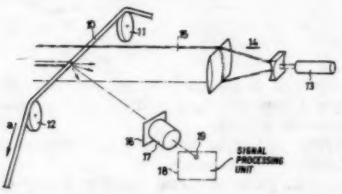
driving means for moving said light-receiving member in synchronism with the scanning of the original.

4,679,932

METHOD OF AND APPARATUS FOR MEASURING MOVING VELOCITY OF LINEAR OBJECT MOVING AND VIBRATING

Koji Morishita; Hujio Hirose, both of Nagaokakyo; Nobuo Nakatsuka, and Masahiro Nishimura, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 6, 1984, Ser. No. 628,314
Claims priority, application Japan, Jul. 7, 1983, 58-124271
Int. Cl.[4] G01P 3/36
U.S. Cl. 356—28 3 Claims



1. A method of measuring the moving velocity of a linear object which is moving while vibrating, said object being a continuous solid substantially linear object, the method comprising the steps of:

illuminating the linear object with a flat laser beam having a width larger than the amplitude of vibration, the linear object moving in the direction of its length and vibrating perpendicular to the longitudinal direction,

receiving the scattered light from the linear object by a photoelectric conversion device through a finite-sized elliptic or slit aperture which is disposed with the direction of its minor axis matching the direction of movement of the linear object, and

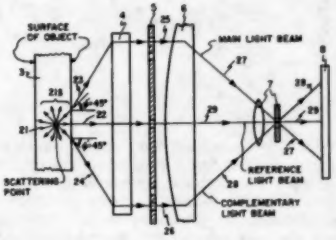
cutting off the d.c. component of a speckle signal from the photoelectric conversion device, counting the number of zero-crossings per second of the resulting signal and converting the count value to a signal representing the longitudinal moving velocity of the linear object.

4,679,933

DEVICE FOR BIREFRINGENCE MEASUREMENTS USING THREE SELECTED SHEETS OF SCATTERED LIGHT (ISODYNE SELECTOR, ISODYNE COLLECTOR, ISODYNE COLLIMATOR)

Jerzy T. Pindera, University of Waterloo, Department of Civil Engineering, Waterloo, Ontario, Canada (N2L 3G1)

Filed Feb. 28, 1983, Ser. No. 397,921
Claims priority, application Canada, Jul. 14, 1982, 407208
Int. Cl.[4] G01B 11/18
U.S. Cl. 356—35 8 Claims



1. Apparatus for measuring state of optical anisotropy or birefringence in solid and liquid bodies comprising (1) a source of radiant energy producing a single, narrow, collimated, primary light beam, circularly or linearly polarized with an adjustable plane of vibration, which is directed into the said body along any selected line of measurement; (2) means for collecting and collimating three primary light sheets-a main light sheet, a complementary light sheet, and a reference light sheet-consisting of light scattered in the said body from the said primary light beam along the line of measurement, the angles between the direction of polarization of the primary light beam given by the direction of the electric field vector and the said three primary light sheets being equal to or close to 0°, 45° and 90°, respectively, where the said primary light sheets consist of scattered light beams carrying information on the state of optical anisotropy or birefringence at each scattering point along the line of measurement; (3) selecting and focusing means for elimination from the said three primary light sheets of all light beams which are scattered under angles oblique to the line of measurement so the resulting three secondary light sheets only consist of originally parallel light beams scattered in the direction normal to the primary light beam which are focused by the said means; (3) means for displaying or recording the distributions of the intensities of light scattered along the line of measurement in the directions given by the said three azimuthal angles using the said three sheets of scattered light.

4,679,934

FIBER OPTIC PYROMETRY WITH LARGE DYNAMIC RANGE

Biswa Ganguly, Beavercreek; Larry P. Goss, Dayton; William M. Roquemore, Dayton, and Darryl D. Trump, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,575
Int. Cl.[4] G01J 5/48
U.S. Cl. 356—43 23 Claims

1. Large temperature range optical pyrometer apparatus comprising:

optical beamsplitting means for segregating photon flux optical signals into first and second component optical signals of predetermined segregated intensity range ratio;

optic meansfor transmitting photon flux optical transmission signals from adjacent an elevated temperature work environ to said beamsplitting means;

first optical attenuation means for generating from said first

component optical signal a first attenuated optical signal of first intensity ratio relationship with said first component optical signal;

second optical attenuation means for generating from said second component optical signal a second attenuated optical signal of second intensity ratio relationship with said second component optical signal;

first optical-to-electrical transducer means, of smaller dynamic range capability than said photon flux energy optical signal, for generating first electrical signals amplitude responsive to said first attenuated optical signal intensity;

second optical-to-electrical transducer means of smaller dynamic range capability than said photon flux energy optical signal, for generating second electrical signals amplitude responsive to said second attenuated optical signal intensity; and

means responsive to the amplitude of a selected one of said first and second electrical signals for generating a pyrometer output temperature indication signal.

4,679,935

LIGHT DISTRIBUTION OF HEADLIGHT BEAM

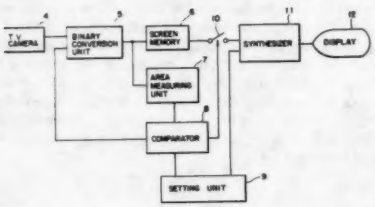
Yutaka Fukuda, Tokorozawa; Koji Minagawa, Chiba; Hiroichi Nabeshima, Hidakamachi; Koihiro Muneki, Hino; Yoshikatsu Asano, Shiki; Kazuo Aoki, Hachiohji, and Yutaka Ishizaka, Shinmachi, all of Japan, assignors to Honda Giken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,828

Claims priority, application Japan, Oct. 28, 1983, 58-201964; Jan. 27, 1984, 59-11894; Aug. 30, 1984, 59-179443

Int. Cl.[4] G01J *1/00*

U.S. Cl. 356—121 **15 Claims**



1. A method for determining a projecting direction of a light beam emitted from a light source, comprising the steps of:

projecting a light beam from a light source toward a screen placed opposite to said light source;

reading a light pattern of said light beam projected on said screen to produce analog image data of the radiant intensity of light segments which comprise said light pattern;

defining a range of light segments comprising said light pattern in which a proportionality relation holds between log S and I wherein I equals a given radiant intensity level and S equals the light segments within said light pattern with radiant intensity level equal to or greater than I;

said proportionality relation being such that a curve representing the rate of change in light intensity with respect to the log of S will be linear irrespective of the light source used;

selecting a reference area comprising said segments of said light pattern wherein said segments are within a range in which said proportionality relation between log S and I holds;

finding a region corresponding to said selected area of said light pattern by threshold determination from said analog image data of said segments of said light pattern so that said region is comprised of light segments having a radiant intensity equal to or greater than I; said region thereby determining the contour of a beam periphery of said projected light beam; and

determining a projecting direction of said light beam using said region thus found by comparing said region, or a point within said region with predetermined reference marks corresponding to correct alignment and orientation of said headlight.

4,679,936

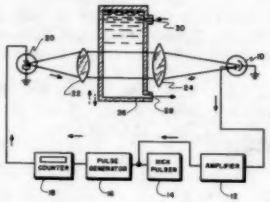
PROCESS AND APPARATUS FOR MEASURING OPTICAL DENSITY CHANGES AND TRANSIT TIMES IN TRANSPARENT MATERIALS

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,421

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—128 **12 Claims**



11. A process of measuring the changing refractive index in a flowing transparent liquid medium on a continuous basis comprising the steps of:

circulating said transparent liquid medium through an enclosed transparent vessel;

transmitting pulses of optical radiation through said vessel and transparent liquid medium;

detecting said pulses of optical radiation;

demodulating and converting the detected pulses of optical radiation into electrical pulses;

amplifying said electrical pulses and applying to an externally triggered high rate pulse generator for producing short duration electrical pulses therefrom;

counting said short duration electrical pulses over a preset counting period; and

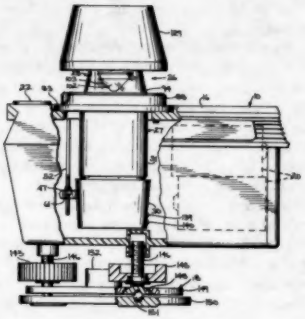
driving a light source in accordance with the arrival of said short duration electrical pulses to propogate the transmitted pulses of optical radiation wherein the process is automatically repeated with the step of said externally triggered pulse generator producing short duration electrical pulses for each repetitive cycle of the mutually complementary optical and electrical pulse in which the pulse repetition rate establishes frequencies which are inversely proportional to transit time delays through said transparent liquid medium.

4,679,937

SELF LEVELING TRANSMITTER FOR LASER ALIGNMENT SYSTEMS

Gary L. Cain, Springfield; Lawrence J. Meyers, Dayton; Ted L. Teach, Dayton, all of Ohio; Joseph F. Rando, Los Altos Hills, Calif., and Theodore J. Markley, Vandalia, Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Oct. 18, 1985, Ser. No. 788,800
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—138 12 Claims



1. A transmitter for an alignment system in which a field of electromagnetic radiation is propagated, said transmitter comprising:

a source for providing a beam of electromagnetic radiation directed along a beam axis;

a bob having a bob longitudinal axis;

means for supporting the bob within the beam with the bob longitudinal axis parallel to the beam axis in a plumb condition, the beam being redirected omni-directionally by the bob in the plumb condition to define a reference field of radiation in a level condition;

wherein an angular error between the plumb condition and the beam axis results in the bob longitudinal axis deviating angularly from the plumb condition to maintain the orientation of the reference field in the level condition; and

a housing surrounding the bob, said housing having an inner surface and an outer surface and being made of a transparent material so that the reflected beam passes through the housing from the inner to the outer surface;

wherein the housing is filled with a transparent liquid to dampen movements of the bob.

4,679,938

DEFECT DETECTION IN FILMS ON CERAMIC SUBSTRATES

Alexander L. Flamholz, Monsey, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

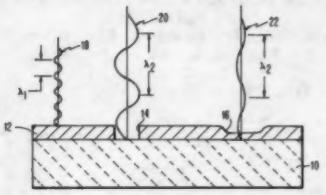
Filed Jun. 3, 1985, Ser. No. 740,158
Int. Cl.[4] G01N *21/88*
U.S. Cl. 356—237 20 Claims

1. A method of detecting defects in a thin film formed on a fluoresceable substrate comprising;

illuminating said film with a first radiation;

generating a second radiation characteristic of the fluorescent spectrum of said substrate; and

analyzing the intensity of said second radiation to identify localized regions of the substrate where the intensity of said second radiation is higher than that of the remainder



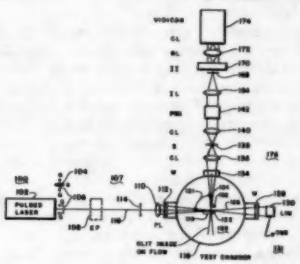
of the substrate, whereby said localized regions correspond to said defects.

4,679,939

IN SITU SMALL PARTICLE DIAGNOSTICS

Bill P. Curry, Dechard; John H. Jones, Shelbyville; Brian L. Seiber; Lynwood L. Price, both of Tullahoma; Homer M. Powell, Auburntown, and Earl L. Kiech, Tullahoma, all of Tenn., assignors to The United States of America as represented by the Secretary of the Air Firce, Washington, D.C.

Filed Dec. 23, 1985, Ser. No. 812,206
Int. Cl.[4] G01N *15/02, 21/53*
U.S. Cl. 356—336 35 Claims



1. Particle stream diagnostic apparatus comprising:

means for illuminating a cross-section of said particle stream with polarized coherent light directed along a lateral axis traversing said stream and cross-section;

means for generating a first electrical signal representing light flux from said illuminating means transmitted across said cross-section through said particle stream;

means located at a predetermined scattering angle with respect to the plane of said cross-section lateral axis and said stream for collecting particle scattered light originating in multiple locations of said illuminated cross-section as first light signals;

means for segregating said first light signals into component second and third signals of dissimilar polarization angles;

means for segregating said second and third light signals over an image plane, each said image plane light signal including geometrically identifiable signal areas originating respectively in light form said cross-section multiple locations;

means for transducing said signal areas in said second and third light signals on said image plane into second and third electrical signal pairs; and

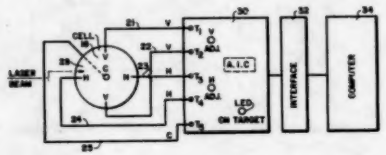
means for analyzing a plurality of said first, second and third electrical signals.

4,679,940

CONTROL SYSTEM FOR A CONTINUOUS CELL TARGET READOUT IN A LASER MEASUREMENT SYSTEM

Martin R. Hamar, 118 Old Ridgefield Rd., Wilton, Conn. 06897

Filed Aug. 1, 1984, Ser. No. 636,835
Int. Cl.[4] G01B 11/14
U.S. Cl. 356—375 7 Claims



1. In a measuring system utilizing a laser beam for determining the position of a given point, the combination comprising:

target means, having a continuous sensing detector cell defining said given point, for sensing the position of incidence of a laser beam thereon and producing signals indicative of said position, said detector cell comprising:

a sensing face;

at least one pair of diametrically opposed electrode means operatively connected to said sensing face for providing a voltage signal indicative of the displacement of the position of incidence of said laser beam on said sensing face from said respective electrode means;

a rear face; and

a common electrode operatively connected to said rear face;

means, operatively connected to said target means, for amplifying said indicative signals and comprising a first operational amplifier means operatively connected to said diametrically opposed electrode means for differentially amplifying said displacement indicative voltage signal;

means, operatively connected to said amplifying means, for automatically maintaining the level of said amplified indicative signals irrespective of variations in the intensity level of said laser beam and comprising:

a second operational amplifier means, operatively coupled to the output of said first operational amplifier means, for amplifying the output voltage signal;

a feedback loop operatively connected across said second operational amplifier means and comprising first switch means for opening and closing said feedback loop; and

means, operatively coupled to said common electrode, for controlling the opening and closing of said first switch means; and

means, operatively connected to said maintaining means, for processing and reading out said amplified indicative signals to provide an indication of the position of incidence of said laser beam with respect to said given point.

4,679,941

MICRO-DIMENSIONAL MEASUREMENT APPARATUS

Hiroo Fujita, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,335
Claims priority, application Japan, Sep. 16, 1983, 58-170762; Apr. 20, 1984, 59-079772
Int. Cl.[4] G01B 11/02
U.S. Cl. 356—384 5 Claims

1. A micro-dimensional measurement apparatus for measuring the distance between at least two edges formed upon a surface of an object, comprising:

an acousto-optical element;

acousto-optical element drive means for generating ultrasonic acousitc travelling waves within said acousto-optical element;

deflection voltage generally circuit means coupled to said acousto-optical element drive means for applying a deflection voltage thereto such that the level of said deflection voltage determines the frequency of said ultrasonic acoustic travelling waves;

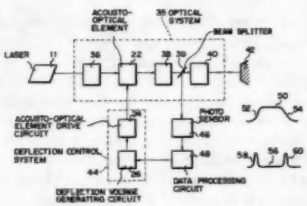
a laser source for generating a light beam, and first optical element means for shaping and directing said light beam to pass through said acousto-optical element and be thereby deflected by an angle which is determined by the frequency of said ultrasonic acoustic travelling waves;

second optical element means disposed to modify the shape of said light beam emerging from said acousto-optical element;

third optical element means disposed to direct said light beam emerging from said second optical eleemnt means onto said body surface and to focus said light beam to form a light spot on said body surface;

photo-sensor means disposed to receive reflected light from said body surface resulting from said light beam impinging thereon, for producing a signal varying in accordance with the intensity of said reflected light;

deflection control circuit means for controlling said deflection voltage generating circuit means such as to vary the level of said deflection voltage at a predetermined rate to thereby correspondingly vary the frequency of said ultrasonic acoustic travelling waves and so vary said angle of deflection of said light beam to thereby scan said light



beam across said body surface at a corresponding speed, and comprising means for storing approximate positions of said edges prior to precise measurement by said micro-dimensional measurement apparatus, said deflection control circuit means operating during said precise measurement in accordance with said approximate edge positions to vary the rate of change of said deflection voltage with respect to time relatively slowly while said light beam is scanning across said body surface in the vicinity of each of said approximate edge positions and to vary said rate of change of deflection voltage relatively rapidly while said light beam is scanning across portions of said body surface substantially distant from said approximate edge positions, and;

data processing circuit means comprising means for detecting when the relationship between consecutively mesured values of said reflected light intensity and corresponding values of said deflection voltage approximately match a predetermined mathematical function, and for differentiating said function to detect a condition of maximum rate of change of said reflected light intensity, for thereby measuring the distance between said at least two edges as represented by a difference between two values of said deflection voltage which correspond respectively to two of said conditions of maximum rate of change of relfected light intensity.

4,679,942

METHOD OF ALIGNING A SEMICONDUCTOR SUBSTRATE AND A PHOTOMASK

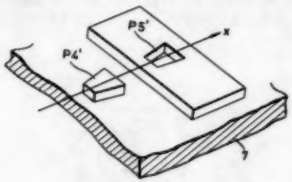
Kyoichi Suwa, Yokohama; Hidemi Kawai, Kawasaki, and Masaichi Murakami, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,941

Claims priority, application Japan, Feb. 24, 1984, 59-33983; Feb. 24, 1984, 59-33984

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—401 **11 Claims**



1. An alignment method for aligning a photomask having a reference mark with a substrate covered with a photosensitive layer and printing the pattern of said photomask on said substrate, comprising the steps of:

(a) providing on said substrate a pair of alignment marks spaced apart from each other by a predetermined distance in a mark area, said pair of alignment marks being formed as a projection and a depression relative to the surroundings, respectively;

(b) providing said photosensitive layer on said substrate so that the outermost surface of said layer is substantially flat;

(c) imaging said pair of alignment marks on an imaging plane by a light having a single wavelength;

(d) comparing images of said pair of alignment marks on said imaging plane with each other in relation to the contrast of said images and determining which one of said images is of better contrast; and

(e) aligning said photomask with said substrate by the use of said reference mark and one of said pair of alignment marks corresponding to said one image.

10. An alignment mark formed on a semiconductor substrate, comprising:

a projecting region projected from a reference surface of said substrate;

a depression formed in said projecting region; and

a projection formed outside of said projecting region and having substantially the same planar shape and size as said depression.

4,679,943

SCENT CLOCK BIMETALLIC DEVICE

James P. Kavoussi, 1401 80th St., Brooklyn, N.Y. 11228, and Louise D. Hartford, 391 Durant Ave., Staten Island, N.Y. 10308

Filed Nov. 7, 1986, Ser. No. 928,242

Int. Cl.⁴ G04B *47/00*; B67D *5/08*

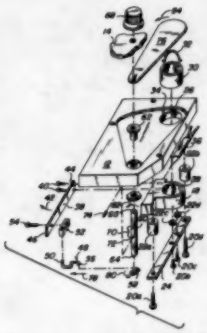
U.S. Cl. 368—12 **4 Claims**

1. A scent clock bimetallic device for releasing odors into the environment comprising:

a. a mass having a cavity for placing a heat sensitive fragrance releasing material, and means for exposing said cavity;

b. a heating means for heating said heat sensitive fragrance releasing material and;

c. a bimetallic strip responsive to said heat caused by said heating means for operating said exposing means for exposing said heat sensitive fragrance releasing material directly to the environment.



4,679,944

ELECTRIC WATCH

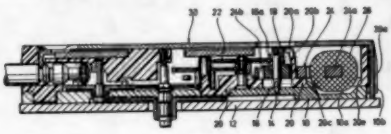
Adlof Sedlak, Wurmberg, and Gerhard Stotz, Pforzheim, both of Fed. Rep. of Germany, assignors to Timex Corporation, Waterbury, Conn.

Filed May 16, 1986, Ser. No. 863,751

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3519876

Int. Cl.⁴ G04F *5/00*

U.S. Cl. 368—157 **3 Claims**



1. In an electric watch comprising a metal frame, a plastic frame, a stepping motor including a rotor and a stator with an associated coil, and a watch movement driven by said rotor of said stepping motor, said rotor being journaled at opposite ends between said metal frame and said plastic frame, the improvement comprising a web on said plastic frame extending substantially perpendicular to the metal frame and penetrating the air gap between said rotor and said stator of said stepping motor, a platelike portion attached to said web and jourlaling one end of said rotor said stator with the associated coil being mounted on the outer side of said plastic frame.

4,679,945

TIMEPIECE

Masao Miyakawa, 15 Aza-ohzukiibu-cho, Toriya-machi, Kashima-gun 929-17, Ishikawa, Japan

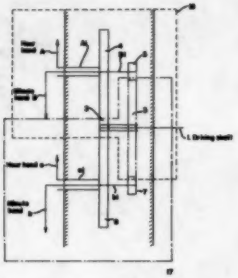
Filed Jul. 3, 1986, Ser. No. 881,907

Int. Cl.⁴ G04B *19/04*

U.S. Cl. 368—238 **5 Claims**

1. A timepiece comprising a rotatable hour hand, a rotatable

minute hand, drive means connected to rotate said hour hand 30° for each hour and connected to rotate said minute hand



390° for each hour, said hour and minute hands overlapping at zero minute and zero second of each hour.

4,679,946

EVALUATING BOTH THICKNESS AND COMPOSITIONAL VARIABLES IN A THIN FILM SAMPLE

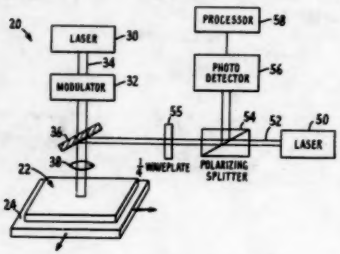
Allan Rosencwaig, Danville, and Jon Opsal, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Filed May 21, 1984, Ser. No. 612,077

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.⁴ G01N *21/41, 25/00*

U.S. Cl. 374—5 **17 Claims**



1. Apparatus for evaluating thickness and compositional variables in a layered or thin film sample by analyzing thermal waves in a sample, said thermal waves being generated by a periodic localized heating at a spot on the surface of the sample, said apparatus comprising:

first means for detecting thermal waves, said first means being of the type which generates output signals that are a function primarily of the surface temperature said first means including

a probe for emitting a beam of radiation;

a means for directing the radiation probe beam within a portion of the periodically heated area on the sample surface in a manner such that the radiation probe beam reflects off the surface of the sample; and

a means for measuring the intensity variations of the reflected radiation probe beam resulting from the periodic changes in optical reflectivity induced by the periodic heating with the measured intensity variations being independent of changes in beam diameter and position;

second means for detecting thermal waves, said second means being of the type which generates output signals that are primarily a function of the integral of the temperature beneath the sample surface; and

means for processing the output signals from said first and second detection means such that information about both layer thickness and compositional variables of the sample may be evaluated.

4,679,947

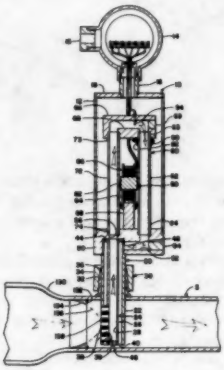
METHOD AND APPARATUS FOR MEASURING STEAM QUALITY

Charles E. Miller; Gerald L. Schlatter, both of Boulder, and Louis T. Yoshida, Longmont, all of Colo., assignors to Engineering Measurements Co., Longmont, Colo.

Filed Jul. 16, 1985, Ser. No. 755,493

Int. Cl.⁴ G01N *9/36;* G01K *17/06*

U.S. Cl. 374—42 **46 Claims**



1. Apparatus for determining steam quality of wet steam flowing in a steam line, comprising:

densitometer means connected to said steam line for measuring the bulk density of the wet steam flowing in the steam line;

temperature measuring means connected to said steam line for measuring the temperature of the wet steam flowing in the steam line; and

computer means connected to said densitometer means and to said temperature measuring means programmed to output steam quality of the wet steam as a ratio of the temperature to the bulk density measurements.

4,679,948

RADIATION PROBE FOR CONTACTLESS MEASUREMENT OF THE SURFACE TEMPERATURE OF AN OBJECT

Günter Hempowitz, and Gustav Meyer-Kretschmer, both of Jülich, Fed. Rep. of Germany, assignors to Uranit GmbH, Jülich, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 796,099

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445677

Int. Cl.⁴ G01J *5/12*

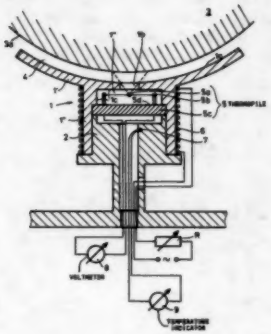
U.S. Cl. 374—129 **3 Claims**

1. Radiation measuring probe for contactless measurement of the surface temperature of an object, independent of the emissivity of the object, comprising:

a radiation receiver;

a housing having interior surfaces defining an interior space, said radiation receiver being disposed in said interior space and thermally insulated with respect to said housing, said housing being formed of a plurality of members including a shield member having a shield surface facing outwardly so as to be towards a surface of the object whose surface temperature is to be measured and a base

member, said shield member having an aperture opening into said shield surface, communicating with the interior space and through which thermal radiation emanating from the object impinges on said radiation receiver, said shield surface being blackened so as to absorb interfering ambient radiation and being configured to correspond to the contour of the surface of the object to be measured,



and said interior surfaces of said housing being of low emissivity; and

a regulatable heating means for regulating the temperature of said housing to correspond to the temperature of said radiation receiver, with the temperature at which correspondence occurs representing the surface temperature of the object.

4,679,949

ELECTRONIC THERMOMETER

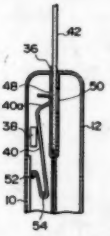
Tamaki Sakamoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 8, 1985, Ser. No. 796,104

Claims priority, application Japan, Nov. 8, 1984, 59-234102; Nov. 9, 1984, 59-236187

Int. Cl.[4] G01K *1/14, 3/00*

U.S. Cl. 374—183 **12 Claims**



1. An electronic thermometer for receiving a temperature probe having a temperature sensing means and a terminal portion, comprising:

(a) means for holding the probe including a pair of probe holding members hingedly connected for pivotal movement from an open position to a closed position, whereby the probe is held between said two probe holding members;

(b) a temperature measuring circuit on said holding means;

(c) means for electrically connecting the terminal portion of the probe to said temperature sensing means and to the temperature measuring circuit;

(d) probe switch means on said holding means;

(e) means for operating said probe switch means only when the probe is held between said members in a predetermined manner;

(f) means for displaying the temperature measured; and

(g) control means for initiating said temperature measuring circuit upon the actuation of said switching means.

4,679,950

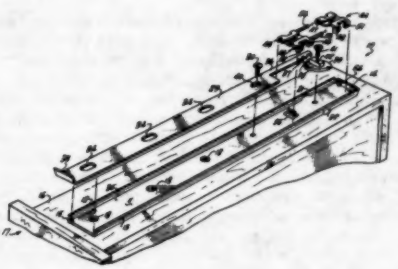
DRAWER SLIDE WITH INFINITE ADJUSTMENT LOCKING MECHANISM

Dale Delmege, Santa Fe Springs, and Richard O. Rask, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Sep. 22, 1986, Ser. No. 909,555

Int. Cl.[4] A47B *88/10*

U.S. Cl. 384—18 **16 Claims**



1. An improved drawer slide with an infinite adjustment locking mechanism for securing the slide in any fraction of its extension, said slide being of the type having an outer slide member having an inner end and an outer end and a pair of inwardly-facing ball bearing supporting grooves, an inner slide member positioned within said outer slide member, said inner slide member having a pair of outwardly-facing ball-bearing supporting grooves, a plurality of ball bearings held between said pair of grooves on said outer slide member and said pair of grooves on said inner slide member, said ball bearings being positioned by a movable ball retainer, wherein the improvement comprises:

a protrusion positioned on the outer surface of at least one of said pair of outwardly facing ball bearing supporting grooves or one of said pair of inwardly facing ball bearing supporting grooves; and

at least one locking ball retainer held by one of said inner slide member or said outer slide member, said locking ball retainer including at least one locking ball bearing positioned adjacent said protrusion and said locking ball retainer further including means for moving said at lest one locking ball bearing into and out of contact with said protrusion, whereby when said at least one locking ball bearing is out of contact with said protrusion, said slide moves freely, but when said at least one locking ball bearing is in contact with said protrusion, the movement of the outer slide member with respect to said inner slide member in the direction of said at least one locking ball bearing causes said at least one locking ball bearing to bind against said protrusion and to inhibit movement of the outer inner slide member in that direction.

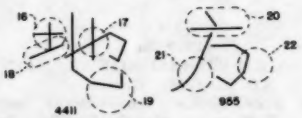
4,679,951
ELECTRONIC KEYBOARD SYSTEM AND METHOD FOR REPRODUCING SELECTED SYMBOLIC LANGUAGE CHARACTERS

Paul L. King; Joseph E. Grimes, and Richard C. Cochran, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 91,862, Nov. 6, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 188,030

Int. Cl.⁴ B41J *5/08*

U.S. Cl. 400—110 **39 Claims**



1. A method of producing ideographic text material utilizing a keyboard having a plurality of keys, each key carrying a single indicium corresponding to a predetermined characteristic stroke configuration found in a graphic character to be produced, comprising:

storing in a memory a plurality of graphic characters having stroke configurations similar to those of characters to be produced, each stored character having an identifier code based on the stroke configuration of that character;

selecting one or more keys to construct for a desired character an identifier code corresponding to its characteristic stroke configurations, the step of selecting one or more keys for each desired character including selecting, for each quadrant of a graphic character wherein a characteristic stroke configuration appears, the single key carrying the indicium which most closely identifies the shape of that stroke configuration, the selection of between one and four single keys in sequence combining to produce a constructed identifier code for the desired character;

calling up from said memory all stored characters having identifier codes identical to the constructed identifier code for said desired character;

temporarily storing said called-up characters;

determining whether an ambiguity exists between the number of characters desired and the number of characters called up by said constructed identifier code and placed in temporary storage;

automatically directing the called-up character to a text storage means if no ambiguity exists; and

resolving any ambiguities caused by a difference between the number of characters desired and the number of characters called up to select a desired called-up character, and thereafter directing the desired called-up character to the text storage means.

4,679,952
PRINTING APPARATUS INCLUDING TAB POSITION PLACEMENT CONTROL

Satoshi Hirota, and Kimihiro Nagamine, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 797,423

Claims priority, application Japan, Dec. 21, 1984, 59-270160

Int. Cl.⁴ B41J *21/14*

U.S. Cl. 400—279 **2 Claims**

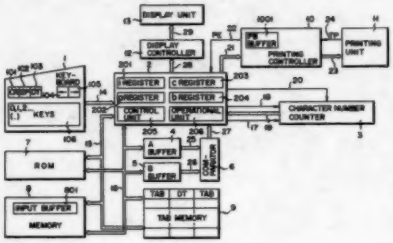
1. A printing apparatus including tab position placement control, comprising:

tab setting means for setting a predetermined digit position as a tab position along a print line comprised of a number of digit positions, with respect to a character data string to be printed on said print line;

means for inputting the character data string, and for inputting tab data designating execution of a tab operation after inputting of the character data string;

memory means, coupled to said inputting means, for storing at specific addresses each character of the character data string and the tab data for designating execution of the tab operation, wherein said specific addresses each correspond to a digit position of the associated character in the character data string as inputted by said inputting means;

processor means including address converting means for converting the specific addresses of certain characters in the character data string as stored in said memory means,



based upon the predetermined digit position set by said tab setting means and after the tab data designating execution of a tab operation is inputted; and

printing means coupled to said processor means for printing the character data string, said printing means including buffer means for storing said certain characters of said character data string at addresses corresponding to the addresses converted by said address converting means so that the printed character data string aligns with the tab position set by the tab setting means at said predetermined digit position along said print line.

4,679,953
PAPER FEEDING AND EJECTING DEVICE FOR A PRINTING APPARATUS

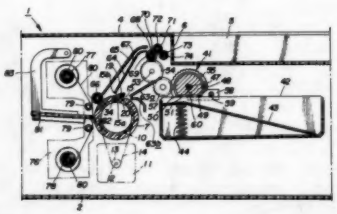
Masakazu Sone, and Takeshi Nakajima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 791,204

Claims priority, application Japan, Oct. 27, 1984, 59-162691[U]

Int. Cl.⁴ B41J *11/58*

U.S. Cl. 400—625 **12 Claims**



1. A paper feeding and ejecting device for a printing apparatus, comprising:

a platen rotatable in a predetermined direction for winding a sheet of paper therearound during printing of said sheet;

a magazine for storing a stack of paper sheets;

feeding roller means disposed above said magazine and being rotatable for feeding a sheet of paper from the top of said stack toward said platen;

feeding guide means extending between said magazine and

said platen for guiding the sheet of paper being fed by said feeding roller means in a feeding path leading to said platen at a predetermined location on the peripheral surface of the platen;

said platen including in a peripheral surface thereof a cutout extending thereacross to define a chucking seat which, in an initial position of said platen, is disposed at said predetermined location for receiving a leading end portion of a sheet of paper propelled by said feeding roller means in said feeding path, and further comprising electrically energizable sheet gripping means on said platen for securing said leading end portion of a sheet on said chucking seat;

paper sensing means arranged in said platen for sensing the presence of a sheet of paper in said cutout and providing an energizing signal for actuating said sheet gripping means

ejecting roller means linked with said feeding roller means and being operative for ejecting a sheet of paper after the printing thereof;

ejecting guide means for guiding the sheet of paper to be ejected to said ejecting roller means from said platen, said ejecting guide means having an entrance adjacent said peripheral surface of the platen at a location thereon spaced in said predetermined direction of rotation of the platen from said predetermined location to which said feeding path extends;

drive means for said platen including a platen drive motor operative to rotate said platen in said predetermined direction during printing and in the opposed direction during ejecting of a sheet which has been printed, and a reversible roller drive motor, means for rotating said ejecting roller means from said roller drive motor, and means including one-way clutch means for rotating said feeding roller means from said reversible roller drive motor only in response to operation of said reversible roller drive motor in one of its reversible directions and in which said roller drive motor is operated in said one direction during said feeding of a sheet of paper from said stack toward said platen, and said roller drive motor is operated in the opposite one of said reversible directions for ejecting of a sheet of paper after the printing thereof.

4,679,954

FLEXIBLE PEN WITH SLIDING SLEEVE

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024

Filed Jan. 22, 1986, Ser. No. 821,541

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] B43K *9/00, 7/00*

U.S. Cl. 401—117 **8 Claims**

1. A pen comprising an elongated one-piece barrel having substantially rigid tip end and head end portions joined to each other by an intermediate integral flexible portion, whereby the barrel can be bent at the flexible portion, a writing tip at the distal end of the tip end portion, a substantially rigid tubular cap member telescopically received over the tip end portion of the barrel and movable along the barrel between (1) a retracted position in which it overlies part of the tip end portion and substantially all of the flexible portion, and thus leaving the writing tip exposed and rendering the pen substantially rigid, and (2) an extended position in which it covers the writing tip and leaves the flexible portion exposed, thus protecting the writing tip and rendering the pen flexible, and means for releasably retaining the cap member in each of the retracted and extended positions, said means including at least one groove in either the outer surface of the tip end of the barrel or the inside surface of the cap member and a boss on the other end of the cap member and barrel received in the groove, the groove being coextensive with the distance between the extended and retracted positions of the cap member and including locking portions at each end offset circumferentially from adjacent end portions of the groove, whereby the cap member is locked in

said respective portions in the absence of rotation relative to the barrel.

4,679,955

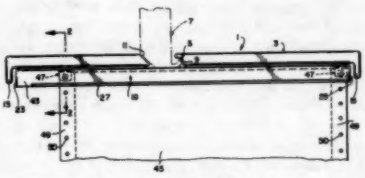
DOCUMENT HOLDER

Jesse Marsh, Viale Romagna 56/3, 20133 Milan, Italy

Division of Ser. No. 744,950, Jun. 17, 1985. This application Apr. 30, 1986, Ser. No. 857,475

Int. Cl.[4] B42F *3/00, 13/00, 15/00;* **B42D** *15/00*

U.S. Cl. 402—4 **4 Claims**



1. A binder element for securing an assembly of sheets provided with alignable apertures, said binder element being adapted to be received in a longitudinal compartment provided by a channel member, said compartment having a particular cross-sectional configuration, which element comprises:

(a) a base section disposable adjacent an edge of the sheet assembly;

(b) first and second side sections extending from and hingedly secured to opposite sides of the base section by relatively thin, flexible hinge means for folding onto opposed sides of the sheet assembly;

(c) a shank pivotally secured to the first side section by relatively, thin flexible hinge means for insertion through the aligned apertures of the sheet assembly; and

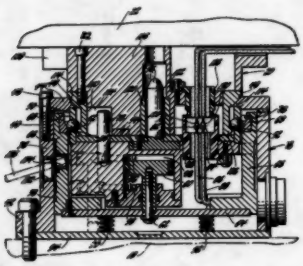
(d) means carried by the second side section for detachable engagement with the shank to secure the element to the sheet assembly, said binder element, when said shank is engaged with said means for detachable engagement, conforming substantially to said cross-sectional configuration of said compartment.

4,679,956

QUICK DISCONNECT DEVICE

Barry D. Douglas, Palo Alto, Calif., and Frederick A. McCurdy, Royal Oak, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 817,280, Jan. 8, 1986, abandoned. This application Aug. 8, 1986, Ser. No. 894,553
Int. Cl.[4] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—14 8 Claims



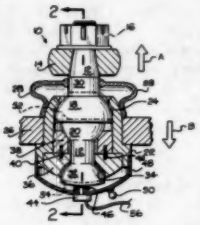
1. A coupling device connecting a work tool to a support and providing a quick disconnect for electrical and fluid connections, said coupling device comprising a first member for rigid connection with said work tool and a second member for rigid connection with said support, a locating pin extending axially from said second member, an opening formed in said first member so when said first and said second members are axially aligned and moved towards each other said locating pin moves into said opening, said first member including a cylindrical base provided with a projecting cylindrical extension, a frusto conical surface formed on the outer surface of said cylindrical base and a locked ring formed on the end of said cylindrical extension, said second member comprising a cylindrical housing which includes a sleeve, a ring member located at the free end of said sleeve and having a frusto conical surface formed on the inner diameter of said ring member that is complementary to said frusto conical surface on said cylindrical base, a cylindrical ball cage spaced radially inwardly from said sleeve and supporting a plurality of balls along the circumference thereof for limited movement in a radial direction out of said ball cage towards said locating pin, said housing having a body portion formed with a cylindrical chamber, a piston located in said chamber, a cam ring located alongside said plurality of balls, means connecting said piston to said cam ring, a cam surface formed on said cam ring so when said piston is in a first position said plurality of balls are pressed by said cam surface radially inwardly out of said ball cage towards the longitudinal center axis of said housing and when said piston is in a second position said plurality of balls are free to float within said ball cage, the arrangement being such that when said first member and said second member are interconnected said one end of said chamber is pressurized to cause said piston to be located in said first position to cause said plurality of balls to engage said lock ring of said first member and urge said frusto conical surface on said cylindrical base of said first member into full surface contact with said frusto conical surface on said ring member of said second member and simultaneously lock said first and second members together, and when the other end of said chamber is pressurized said piston is located in said second position and said first and second members can be separated.

4,679,957

BALL JOINT SAFETY SYSTEM

John K. Bauer, 510 Lenox Ave., Miami Beach, Fla. 33139

Filed Jun. 10, 1986, Ser. No. 872,525
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—27 18 Claims



1. A ball joint assembly comprising,
main shaft having a longitudinal axis,
a primary ball having an axially symmetric, rounded outer surface coaxially mounted to said main shaft,
a primary bearing surface having a shape similar to the primary ball outer surface and being in frictional contact therewith, said primary bearing surface being relatively stationary with respect to said primary ball,
a secondary ball having an axially symmetric, rounded outer surface coaxially formed on said main shaft and spaced apart from the primary ball, and
a secondary bearing surface having a shape similar to the secondary ball outer surface and adjacent to, but spaced apart from, said secondary ball by a predetermined distance so as to define a substantially uniform gap about said secondary ball outer surface, said secondary bearing surface being relatively stationary with respect to said secondary ball, said main shaft, primary and secondary balls being movable with respect to said primary and secondary bearing surfaces, said gap permitting the secondary ball to move substantially free from contact with said secondary bearing surface with movement of said main shaft.

4,679,958

BALL JOINT

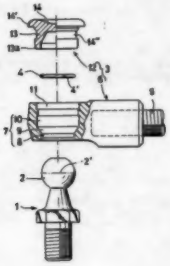
Akira Mizusawa, Fujisawa, and Daiji Nakama, Chigasaki, both of Japan, assignors to Nifco, Inc., Yokohama, Japan

Division of Ser. No. 744,304, Jun. 13, 1985, Pat. No. 4,568,216, which is a continuation of Ser. No. 430,361, Sep. 30, 1982, abandoned. This application Dec. 9, 1985, Ser. No. 807,016
Claims priority, application Japan, Oct. 23, 1981, 56-156928; Jun. 15, 1982, 57-88058
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—143 2 Claims

1. A ball joint comprising:
a ball stud having a ball at the leading end thereof;
a plastic main body having a through hole which comprises a small-diameter protion on one side thereof, a large-diameter portion on the other side thereof and a tapered portion between said small-diameter portion and said large-diameter portion, said large diameter portion having a retaining portion;
a cup-shaped auxiliary body being snugly fitted in said large-diameter portion of said through hole in said main body and having the leading end thereof extending to said tapered portion of said through hole, said leading end having engaging means which engage said retaining portion to retain said auxiliary body in said through hole;
a resilient metallic ring for retaining said ball within said

through hole, said resilient metallic ring having a cut therein,

whereby said ball stud having said ball inserted into said through hole from said small-diameter portion and passed through said resilient metallic ring while enlarging the diameter of said resilient metallic ring, after inserting said



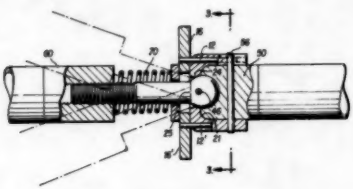
resilient metallic ring into said through hole from said large-diameter portion and then fitting said cup-shaped auxiliary body snugly in said large-diameter portion, is prevented from being released from said through hole by said resilient metallic ring which is pushed enlarged in diameter by insertion of said ball and which, upon passage of said ball therethrough, is returned to its original state.

4,679,959

QUICK-CONNECT/DISCONNECT CONNECTOR

Paul V. Cavallaro, Canton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 16, 1986, Ser. No. 919,956
Int. Cl.[4] F16C *3/00, 11/00*
U.S. Cl. 403—143 **7 Claims**



1. Means for detachably connecting together a first member and a second member, comprising:

a shaft;

means for securing one end of said shaft to said first member;

said shaft being formed with a generally spherical head at its end remote from said first member;

said second member being formed with a generally semi-spherical recess in one face thereof for receiving therein the generally spherical shaft head; and with at least one redially projecting retainer rod;

a slide member that is mounted for sliding movement on said shaft intermediate said first member and said shaft head, said slide member being formed with at least one pin that projects axially of said shaft from said slide member and toward said second member;

a sleeve adapted to seat about the end of said second member, said sleeve being generally cup-shaped and formed with a web portion and with an annular wall, said web being formed with an aperture to receive said shaft therethrough but to prevent passage of said shaft head therethrough, the annular wall of said sleeve being formed with at lease one axially-extending opening for the receptin of said pin or pins therein and with at least one generally L-shaped slot for receiving therein said retainer rod on said second member upon assembly of said sleeve about the end of said second member and manipulation of said sleeve to seat said retainer rod in said slot; and

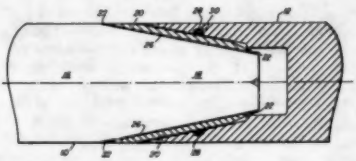
urging means disposed to constantly urge said slide member in its assembled position toward the end of said second member.

4,679,960

CERAMIC AND METAL BRAZED ARTICLES

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 25, 1985, Ser. No. 695,019
Int. Cl.[4] B25G *3/34*
U.S. Cl. 403—272 **10 Claims**



1. An article consisting essentially of:

(a) a ceramic shaft having a truncated conical portion,

(b) a substantially solid metal shaft having a substantially cylindrical periphery machined with a recess having internal surfaces substantially matching the external surface of said truncated conical portion and with a chamber adjacent said recess

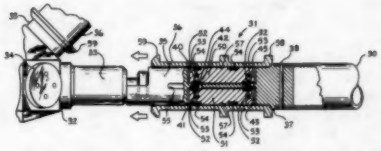
(c) a ductile active brazing alloy joining the internal surfaces of said truncated conical portion of said ceramic shaft to the matching internal surfaces of said recess of said metal shaft said article having said chamber between the end of said ceramic shaft and said metal shaft.

4,679,961

COUPLING MECHANISM

James P. Stewart, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jun. 16, 1986, Ser. No. 874,980
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—341 **10 Claims**



1. A method of coupling a first object to a second object, said method comprising the steps of:

(a) securing a proximal end of a male member to said first object, said male member being substantially symmetric about an axis of elongation, a distal end of said male member being configured generally as a know that is symmetric about said axis of elongation;

(b) securing a proximal end of an elongate female member to said second object, a distal end of said female member having a contoured surface configured to receive said knob on said distal end of said male member when overlapping side contact of said contoured surface with said knob is made from any direction of approach transverse to said axis of elongation of said male member;

(c) bringing said contoured surface on said female member into overlapping side contact with said knob on said male member to achieve mating engagement between said female member and said male member; and

(d) moving a sleeve from a first position around an intermediate portion of said female member to a second position around said distal ends of said male and female members when said knob on said male member and said contoured surface on said female member are in overlapping side contact with each other, thereby locking said male and female members in said mating engagement with each other.

4. An apparatus for coupling a first object to a second object, said apparatus comprising:

(a) a male fixture, said male fixture being substantially symmetric about an axis of elongation, a proximal end of said male fixture being securable to said first object, a distal end of said male fixture having a knob-like extremity that is symmetric about said axis of elongation;

(b) a female fixture, said female fixture including:

(i) an elongate cylindrical member, a proximal end of said cylindrical member being securable to said second object, a distal end of said cylindrical member being of partially cylindrical configuration with an inner surface having a recessed portion that is contoured and dimensioned to receive said knob-like extremity on said distal end of said male fixture when overlapping side contact is made between said distal end of said male fixture and said inner surface on said distal end of said cylindrical member of said female fixture from any direction of approach transverse to said axis of elongation of said male fixture; and

(ii) a sleeve member, said sleeve member being positioned coaxially with respect to said cylindrical member, said sleeve member being slidable longitudinally over said cylindrical member from an OPEN position at which said distal end of said cylindrical member is exposed to permit overlapping side contact between said distal end of said male fixture and said inner surface on said distal end of said cylindrical member of said female fixture to a LOCKED position at which said inner surface on said distal end of said cylindrical member of said female fixture and said knob-like extremity on said distal end of said male member are surrounded by said sleeve member;

said sleeve member thereby coupling said male fixture to said cylindrical member of said female fixture when said knob-like extremity on said distal end of said male fixture has been received in said recessed portion of said inner surface of said cylindrical member of said female fixture and said sleeve member has been slide to said LOCKED position.

4,679,962

AUTOMOTIVE ROLLING MACHINE

Tohru Mihara, Kyoto; Kiyoshi Sato, Yoshikawa, and Yasuo Terauchi, Kumagaya, all of Japan, assignors to Taisei Road Construction Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,477

Claims priority, application Japan, Jul. 31, 1985, 60-168790

Int. Cl.[4] E01C *19/26*

U.S. Cl. 404—126 **6 Claims**

1. An automotive rolling machine for use in paving a large, flat ground surface comprising:

a main frame section and a frame mounted therein having a longitudinal axis,

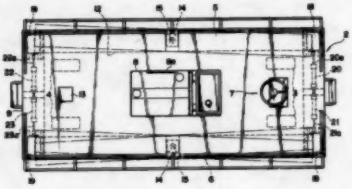
an elongate pressure roller mounted to at least one side of the main frame section as viewed in the longitudinal direction of said frame,

laterally extending slider guides provided at the front and rear of the underside of said frame, respectively,

sliders for steering the roller and slidably fitted into said slider guides,

at least one elongate center pin provided at a central portion of at least one side of said frame as viewed in the longitudinal direction thereof in such a manner that the longitudinal axis of said center pin is supported in a vertical orientation, said elongate center pin being mounted for pivotal movement with respect to said frame,

at least one lower frame member for supporting said roller, said at least one lower frame member being fixed to a lower portion of said elongate center pin, respectively, said lower frame member being movably connected, at its front and rear end portions, to said sliders, and



means for moving said slider relative to said frame whereby the longitudinal axis of said roller may effectively be pivoted relative to the longitudinal axis of said main frame, about a pivot axis that is coincident with the axis of said center pin(s), respectively,

whereby the automotive rolling machine may be steered by an operator while it is in use, without deforming the surface to be paved with said roller.

4,679,963

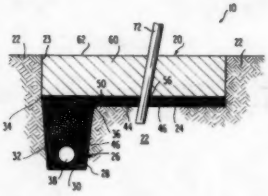
PLAYGROUND CONSTRUCTION

Robert G. Heath, 823 West St., Harrison, N.Y. 10528

Filed May 27, 1986, Ser. No. 866,671

Int. Cl.[4] E02B *13/00*

U.S. Cl. 405—36 **11 Claims**



1. A playground construction comprising:

an earthen floor distance beneath the surface of the earth having a grade of at least 1°;

opposing walls extending upwardly from said floor to the surface of the earth;

a trough in said floor adjacent to one of said walls;

a layer of water-pervious material lining said trough and said floor and having a blanket section at one end and a flap section at the other end;

a first layer of aggregate material in said trough and on said floor;

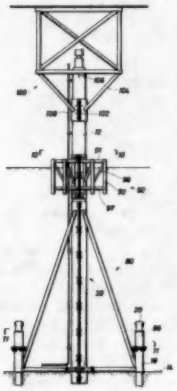
said first layer of aggregate material enveloped by said layer of water-pervious material, blanket section and flap section; and

a second layer of aggregate material different in compostion from the first layer and extending above said first layer of aggregate material and terminating at the surface of the earth.

4,679,964
OFFSHORE WELL SUPPORT MINIPLATFORM

Joseph W. Blandford, Houston, Tex., assignor to Seahorse Equipment Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 622,990, Jun. 21, 1984, Pat. No. 4,558,973. This application Dec. 16, 1985, Ser. No. 809,162
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] E02B *17/02*; E02D *31/00*
U.S. Cl. 405—216 20 Claims



1. A protective well support system to be installed on an offshore well having an upstanding conductor pipe extending above the seabed, the system comprising:

(a) an upstanding conductor clamp adapted to encircle the conductor pipe, said conductor clamp formed by two upstanding facing members supported by a bottom engaging frame;

(b) said frame including a plurality of frame members joined together defining a substantially horizontal rectangular support frame for engaging the seabed;

(c) a plurality of angularly extending brace members secured at one end to said conductor clamp and at the other end to said frame;

(d) said conductor clamp being attached to said frame and extending upright thereabove to enable said conductor clamp to fasten about the conductor pipe;

(e) a boat landing mounted about the conductor pipe, said boat landing formed by at least two sectional components fixedly secured to semicircular clamp members adapted to encircle the conductor pipe for mounting said boat landing components thereon; and

(f) well platform means supported on bracket means adapted to encircle the conductor pipe for removably securing said well platform means thereon.

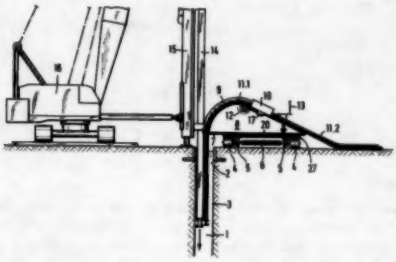
4,679,965
METHOD AND APPARATUS FOR INSTALLING PANELS INTO RECESSES IN THE GROUND

Eberhard Gläser, Aichwald, and Eberhard Beitinger, Stuttgart, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,873
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444690
Int. Cl.[4] E02D *5/20*
U.S. Cl. 405—258 28 Claims

1. An apparatus for inserting a panel into a substantially vertical suspension-filled slot in the ground to form an underground barrier, said slot having an elongate opening lying in a ground surface, said panel being provided along opposed substantially vertical edges with reinforcing elements, said apparatus comprising:

deflecting means for bending the panel during an insertion operation along a feed path extending substantially perpendicularly with respect to the opening of the slot so that a leading end portion of said panel at said slot has a substantially vertical orientation extending parallel to said slot and a trailing end portion of said panel has an orientation inclined with respect to said slot, said deflection means including a deflection body with an arcuate surface extending in part parallel to the opening of said slot and having a radius of curvature at least as large as a minimum permissible radius of curvature of said panel in a direction parallel to said feed path and extending from said trailing



end portion to said leading end portion, said deflection body being provided at opposite sides with additional means for aiding a bending of said panel during an insertion operation, said additional means including a pair of slotted tubes at least partially surrounding the reinforcing elements of said panel upon a positioning of said panel on said arcuate surface;

support means operatively coupled to said deflection body for supporting said deflection body in a preselected orientation and a preselected position at the opening of said slot; and

panel shifting means disposable at said slot and engageable with said leading end portion of said panel for moving said panel over said arcuate surface and into said slot.

4,679,966
ROOF BOLT APPARATUS WITH EXPANSION SHELL AND COUPLING

Paul A. Yacisin, Patton, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 808,873, Dec. 13, 1985, abandoned, which is a continuation of Ser. No. 644,348, Aug. 27, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 908,163
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—261 11 Claims

1. Apparatus for supporting a rock formation comprising,

an elongated rod positioned in a bore hole of a rock formation,

said rod having a first threaded end portion and a second threaded end portion, said rod first threaded end portion being positioned adjacent the end of said bore hole,

an expansion shell assembly engaged to said rod first threaded end portion,

an elongated bolt positioned in said bore hole below said rod second threaded end portion, said bolt having a first threaded end portion and a second end portion,

said bolt first threaded end portion being positioned oppositely of said rod second threaded end portion,

a bearing plate positioned on said bolt second end portion,

means for threadedly connecting said bolt to said rod,

stop means associated with said means for threadingly connecting said bolt to said rod for limiting axial movement of

said bolt relative to said rod to permit unitary rotation of both said bolt and said rod in a preselected direction,

said expansion shell assembly being operable upon rotation of said rod to anchor said rod in said bore hole, and

said bolt being operable to rotate in said preselected direction relative to said rod anchored in said bore hole to disengage said stop means to axially advance said bolt relative to said rod and tension said bolt.

4,679,967

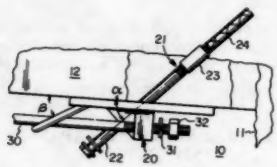
TRUSS BRACKET

Edward C. Hipkins, Sr., Oakdale, and Frank M. Locotos, Bridgeville, both of Pa., assignors to F. M. Locotos Co., Inc., Pittsburgh, Pa.

Filed Jul. 25, 1985, Ser. No. 758,707

Int. Cl.[4] E21D *20/00*

U.S. Cl. 405—288 **10 Claims**



1. A truss bracket for use in a mine roof support system comprising:

a substantially flat, planar member for engagement with a mine roof, said planar member having an angularly disposed aperture to accommodate an anchor bolt extending into the mine roof;

an extension depending normal to said planar member, said extension having a channel angularly disposed to said planar member and in axial coincidence with said aperture in said planar member to accommodate the anchor bolt extending through said aperture in said planar member and into the mine roof, said extension further having a pair of openings spaced from each other and from said planar member and positioned on opposite sides of said channel, each of said openings to accommodate a tie bar in parallel relationship to said planar member and to each other; and

a tie bar support ring angularly disposed to said planar memer and spaced from said extension to form an opening in line with said pair of openings in said extension, said support ring to accommodate said tie bars extending therethrough upon sagging.

4,679,968

INDEXABLE CUTTER INSERT

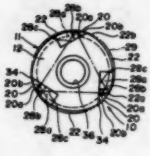
Osamu Tsujimura, Kawasaki; Ryoei Hasegawa, Ota, and Masayuki Ohkawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,774

Claims priority, application Japan, Jun. 28, 1985, 60-98985[U]; May 16, 1986, 61-73506[U]

Int. Cl.[4] B23B *27/16*; B23C *5/20*

U.S. Cl. 407—114 **6 Claims**



1. A cutter insert of the indexable type for a rotary cutter comprising a body comprising a plate of a generally circular shape defined by a front face, a rear face and a circumferential face lying between said front and rear faces, said body having three notches of a V-shape formed in said circumferential face in circumferentially equally-spaced relation to one another to interrupt said circumferential face to provide three circumferentially equally-spaced side faces, each of said V-shaped notch being defined by a pair of first and second opposed walls converging radially inwardly of said body;

each of said side faces cooperating with said front face to define an arcuate convex cutting edge, so that said cutting edge extends between said first wall of one of each two adjacent V-shaped notches and said second wall of the other, said cutting edge having a leading end where it intersects said first wall of said one notch and also having a trailing end where it intersects said second wall of said other notch, three straight lines each extending between each adjacent ones of said leading ends of said three cutting edges defining a substantially equilateral triangle, each of said arcuate cutting edges assuming a part of a circle having a radius greater than a radius of a circumcircle circumscribing said equilateral triangle;

a marginal portion of said front face disposed adjacent and extending along each cutting edge serving as a rake surface for said cutting edge, said rake surface being recessed adjacent to said first wall of said V-shaped notch so as to slope toward said rear face toward said first wall to provide a convex portion extending between said front face and said first wall;

said first wall of each V-shaped notch sloping toward said trailing end of the adjacent cutting edge at said second wall of said notch and being inclined with respect to a plane disposed perpendicular to said front face and passing through a center of said circle along which said arcuate cutting edge extends and said leading end of said cutting edge disposed at said first wall.

4,679,969

POSITIVE FEED DRILL CLAMP SYSTEM

Patrick J. Riley, Columbus, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 7, 1986, Ser. No. 848,652

Int. Cl.[4] B23B *45/14, 49/02*

U.S. Cl. 408—87 **17 Claims**

1. A portable drill system for drilling a hole in a workpiece, comprising:

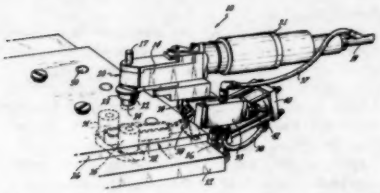
a drill;

a drill bit operably connected to the drill;

a power source connected to the drill for driving said bit;

feed means for feeding said bit into and out of the workpiece;

a housing for said feed means;
a guide plate detachably mounted to the workpiece,
said guide plate engaging a head portion of said drill to guide said drill bit into a desired location on the workpiece; and

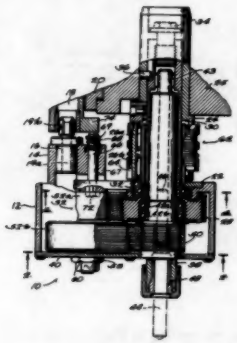


a clamp means connected to said housing for clamping the workpiece against said housing.

4,679,970
HIGH SPEED TOOLHOLDER FOR A MACHINING CENTER

Earl R. Lohneis, Milwaukee, and Robert T. Woythal, West Allis, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Aug. 26, 1981, Ser. No. 296,333
Int. Cl.⁴ B23B *47/14*
U.S. Cl. 408—128 **1 Claim**



1. In a tool head adapted to be inserted in the spindle of a machine tool and including a drive mechanism arranged to be actuated by the machine tool spindle for driving a cutter at a rate different than the rate of rotation of the machine tool spindle; a housing enclosing said drive mechanism; an input shaft journaled in said housing and adapted to be coupled to the machine tool spindle for transmitting the drive from the machine tool spindle to said drive mechanism; a hollow bore retention pin extending from said housing for engagement in a suitable opening in the machine tool for retaining said housing stationary while said drive mechanism is being actuated by the machine tool spindle and for communicating with a source of air pressure in the machine tool when said input shaft is coupled to the machine tool spindle for directing the air pressure through the hollow bore in the retention pin for cooling said drive mechanism in said housing; means locking said retention pin to said input shaft whenever the tool head is removed from the spindle so that said retention pin is in position to enter the opening in the machine tool when the tool head is mounted to the machine tool by an automatic tool change mechanism; and release means arranged to be actuated by the movement of the tool head as its input shaft is inserted into the spindle for releasing said locking means to permit said input shaft to be driven by the machine tool spindle relative to said retention pin.

4,679,971
ROTARY CUTTING TOOL AND PROCESS FOR MAKING SAME

Andreas Maier, Schwendi-Hörenhausen, Fed. Rep. of Germany, assignor to Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,531
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232686
Int. Cl.⁴ B23C *51/02*
U.S. Cl. 408—145 **19 Claims**

1. A rotary cutting tool comprising:
a metallic member centered on an axis;
a generally cylindrical working head consisting in its entirety of an ultrahard polycrystalline incisive material of polycrystalline diamond or cubic boron-nitride and coaxial with and bonded to one end of said metallic member by metallic interpenetration under vacuum or crystalline growth along a generally transverse interface extending over the entire cross-sectional area of said metallic member;
a tool body; and
a junction separating said elongate metallic member from the tool body and axially spaced from said interface, said junction being preformed from a foil comprising two solder layers on opposite sides of a highly heat-conductive metal wafer, said working head having an end face with at least one frontal cutting edge and a flute for guiding away workpiece chips cut out by said cutting edge, the flute being formed in the working head through said interface into said metallic member and extending at least generally axially past said interface onto an adjoining portion of said elongate metallic member.

4,679,972
DEVICE IN ROTARY TOOLS

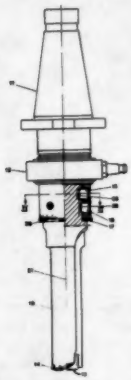
Kjell Andersson, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Aug. 24, 1983, Ser. No. 526,078
Claims priority, application Sweden, Nov. 12, 1982, 8206434
Int. Cl.⁴ B23B *39/00*
U.S. Cl. 408—150 **8 Claims**

1. A rotary cutting tool such as a drill or shank end mill, comprising:
a tool holder rotatable about a first axis,
a sleeve carried by said tool holder and rotatable relative thereto about a second axis,
a tool element including generally radially disposed cutting edge means having a radially inner end situated immediately adjacent said first axis, said tool element mounted in said sleeve such that said sleeve is rotatable relative to said tool element about a third axis spaced from, and disposed parallel to, said second axis such that rotation of
said sleeve displaces said third axis relative to said first and second axes along an arcuate path of adjustment to vary the size of a hole being cut by said cutting edge means,
said sleeve being arranged such that said second axis is

spaced from, and disposed parallel to, said first axis to minimize the distance by which said inner end of said cutting edge means becomes spaced from said first axis during travel of said third axis along said path of adjustment,

a stop member extending between said holder and said tool element for maintaining a constant rotational position of said tool element with respect to said holder following a rotation of said sleeve, and



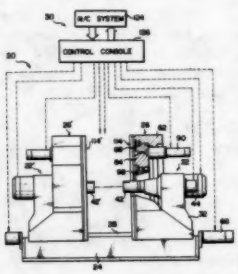
said third axis being movable along said path of adjustment between a maximum diameter cutting position and a minimum diameter cutting position of said cutting edge means, said inner end of said cutting edge means being spaced farther from said second axis when said third axis is disposed intermediate said maximum and minimum diameter cutting positions than when said third axis is at either of said cutting positions.

4,679,973

CRANKSHAFT MILLING MACHINE

Kazuo Kodama, Komatsu, and Keishi Morikawa, Fukui, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,948
Int. Cl.[4] B23C *3/06*
U.S. Cl. 409—200 **11 Claims**



1. A milling machine for machining crankshaft or the like, comprising

(a) means for holding a workpiece generally oriented in a first direction;

(b) a slide reciprocably movable relative to the holding means in a second direction at right angles with the first direction;

(c) means for controllably moving the slide back and forth in the second direction during machining;

(d) a tool holder rotatably mounted to the slide for rotation about an axis extending generally parallel to the first direction;

(e) means for controllably and angularly reciprocating the tool holder relative to the slide in opposite angular directions within specific limits during machining;

(f) an annular cutting tool rotatably mounted to the tool holder in an eccentric position thereon for bi-directional rotation about an axis extending generally parallel to the first direction, the cutting tool having internal cutting edges bounding a space for receiving with clearance the workpiece being held by the holding means; and

(g) means for revolving the cutting tool relative to the tool holder.

4,679,974

VEHICLE CHOCK BLOCK APPARATUS FOR RAILROAD CAR TRANSPORT OF VEHICLES

Donald J. Blunden, Plymouth, Mich., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Oct. 28, 1985, Ser. No. 792,306
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] B60P *3/07*; B60T *3/00*
U.S. Cl. 410—30 **12 Claims**

FIG. 7

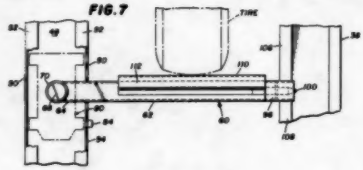
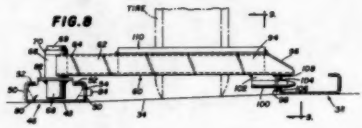


FIG. 8



1. A railroad car having at least one deck for supporting and transporting four-wheel vehicles such as automobiles and trucks;

a pair of spaced apart first and second parallel tracks, secured to the deck longitudinally of the railroad car, having clearance for the wheels on one side of the vehicle to roll between the tracks;

a pair of movable chock block means for each vehicle transported on the deck to secure the vehicle against longitudinal movement;

each chock block means including a substantially horizontal bar with a first end and a second end;

a carriage permanently secured to the first track so that it cannot be removed from the first track but so that it can be moved along the longitudinal axis of the first track without rotation about a vertical axis;

means connecting the bar first end to the carriage so that the bar first end can rotate about a substantially vertical axis at least about 90°;

the carriage having means for releasably securing the carriage in a fixed position along the first track;

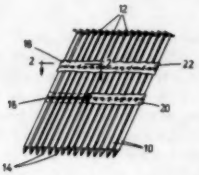
the bar second end having means for releasably securing the bar second end in a fixed position along the second track wherein release of the bar second end from fixed position along the second track requires displacement of the bar

first end along the first track for a short distance and securing the bar second end in fixed position along the second track requires displacement of the bar first end along the first track for a short distance.

4,679,975
NAIL STRIP WITH COVERED WIRE ATTACHING MEANS

Herbert E. Leistner, 167 Sweeney Drive, Toronto, Ontario, Canada

Filed Apr. 29, 1986, Ser. No. 857,184
Int. Cl.[4] F16B *15/08*
U.S. Cl. 411—443 **7 Claims**



1. A nailing strip for use in a power-operated nailing hammer of the type wherein the operation of said nailing hammer separates a nail from said strip, and drives said nail into a workpiece, and which nailing strip comprises:

a plurality of nails each having a cylindrical shaft and arranged in a strip with said shafts thereof disposed in mutually parallel and spaced apart disposition;

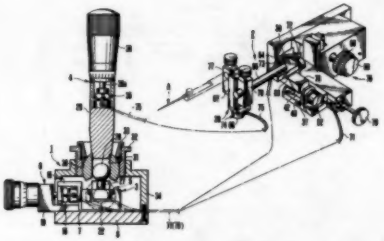
two mutually spaced apart and mutually parallel flexible junction wire means extending across said nailing strip and welded to the cylindrical shaft of each said nail in said strip; and,

flexible and breakable sheath means covering and extending completely around each said wire means between adjacent ones of said nails and over an outer surface of each said junction wire means at each of said nails thereby to enhance the severing of said wire means during driving of a said nail from said strip.

4,679,976
MANIPULATOR USABLE FOR A GLASS ELECTRODE OR THE LIKE

Eiichi Narishige, and Shinji Yoneyama, both of Tokyo, Japan, assignors to Narishige Scientific Instrument Laboratory, Ltd. and Narishige Corporation Limited, both of Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,802
Claims priority, application Japan, May 17, 1985, 60-105319
Int. Cl.[4] B25J *13/02*
U.S. Cl. 414—4 **5 Claims**



1. A manipulator for manipulating a glass electrode comprising:

an actuating section having the glass electrode mounted thereon, said actuating section including an X-coordinate displacing means for displacing said electrode in an X-coordinate direction, a Y-coordinate displacing means for displacing said electrode in a Y-coordinate direction, and a Z-coordinate displacing means for displacing said electrode in a Z-coordinate direction, each of said X-coordinate, Y-coordinate and Z-coordinate displacing means including a hydraulic cylinder filled with a hydraulic medium; and

a driving section for driving said actuating section, said driving section including a X-Y coordinate plane driving means, said X-Y coordinate plane driving means comprising an X-coordinate rectilinear driving means and a Y-coordinate rectilinear driving means and a tiltable lever including a Z-coordinate driving means and operatively coupled to said X-Y coordinate plane driving means, each of said X-coordinate, Y-coordinate and Z-coordinate driving means including a hydraulic cylinder filled with a hydraulic medium, the hydraulic cylinder of the X-coordinate rectilinear driving means being in hydraulic communication with the hydraulic cylinder of the X-coordinate displacing means, the hydraulic cylinder of the Y-coordinate rectilinear driving means being in hydraulic communication with the hydraulic cylinder of the Y-coordinate displacing means and the hydraulic cylinder of the Z-coordinate driving means being in hydraulic communication with the hydraulic cylinder of the Z-coordinate displacing means;

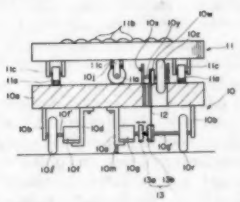
each said hydraulic cylinder of said displacing means including a very small diaphragm; and

each of the displacing means including a baseboard to which a respective hydraulic cylinder is fixedly secured; a slider slidably mounted on said baseboard, said slider including a piston rod means which extends towards said respective hydraulic cylinder, a forwardmost end of said piston rod means operatively engaging the diaphragm of said respective hydraulic cylinder; an end plate member mounted to said baseboard adjacent a rearward end of said slider; and a return spring means extending from said end plate member into an elongated hole defined in said slider for urging said piston rod means into engagement with said diaphragm.

4,679,977
AUTOMATIC GUIDED VEHICLE

Hideaki Minami, Osaka, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Nov. 4, 1985, Ser. No. 794,647
Int. Cl.[4] B60P *1/52*
U.S. Cl. 414—533 **5 Claims**



1. An automatic guided vehicle comprising

a travelling truck being provided with power sources, driving wheels driven by said power sources respectively, said power sources selectively driving said driving wheels at different speeds for steering,

a loading table for loading an object to be conveyed, being provided above said travelling truck and capable of horizontal turn about a vertical axis, and

a turning means for said loading table, which selectively turns said loading table relative to said travelling truck,

said turning means for said loading table makes said loading table turn in the reverse direction with respect to said

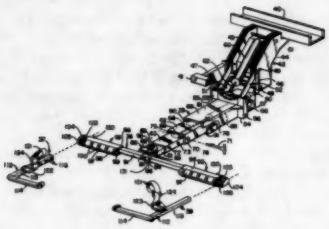
trvelling truck and at an amount equal to the whirling amount of said travelling truck when said travelling truck whirls for steering.

4,679,978

WHEEL LIFT TOWING ASSEMBLY

Gerald E. Holmes, Chattanooga, Tenn., and Jerry E. Pace, Rossville, Ga., assignors to Century Wrecker Corporation, Ooltewah, Tenn.

Continuation of Ser. No. 530,517, Sep. 9, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,739
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—563 8 Claims



1. Apparatus for installation to a tow truck with a low profile rear end comprising a telescoping tow bar assembly means for lifting and towing wheeled vehicles in a position such that a portion of the front end of said towed vehicle extends over the rear end of the truck, said tow bar assembly means having a forward end and a rear end with its forward end extending under the rear portion of said tow truck and with its rear end extending rearwardly from the tow truck, a cross arm pivotably connected between its ends about a vertical pivot axis to the rear end of said tow bar assembly, first and second L-shaped wheel cradles mounted to respective opposite end portions of said cross arm, each said wheel cradle being adapted to confine a wheel of a vehicle to be towed against said respective portion of said cross arm with one portion of said wheel cradle parallel to said cross arm and against a lower circumferential surface portion of said wheel, and a second portion of said wheel cradle coupling said first portion to said respective portion of said cross arm, said wheel cradles being movable along said cross arm closer together or further apart to receive wheels of vehicles of various widths, extension means coupled to said tow bar assembly for telescoping the tow bar assembly to move said cross arm toward and away from the tow truck, support means comprising parallel linkage projecting under the low profile rear end of the tow truck and extending downward to engage said tow bar assembly to retain said tow bar assembly in a substantially horizontal attitude while allowing elevation thereof, and elevation means extending through and coupled to said support means and adapted to move said cross arm, said extension means and said tow bar assembly between a lowest position substantially on the ground and a highest position above the ground, whereby at the lowest position said wheel cradles can capture the front or rear wheels of a wheeled vehicle and the tow bar assembly and the cross arm can be elevated by said elevation means and retracted by said extension means so as to maintain said pivot axis in a substantially vertical orientation and raise and move the forward portion of the towed vehicle to a position adjacent the rear wheels of the tow truck.

4,679,979

METHOD OF UNLOADING LARGE CONTAINERS

Robert Rasmussen, Berlin, N.J., assignor to Accurate Industries, Inc., Williamstown, N.J.

Division of Ser. No. 468,319, Feb. 22, 1983, Pat. No. 4,599,040. This application Dec. 9, 1985, Ser. No. 806,911
Int. Cl.[4] B60P *1/48*
U.S. Cl. 414—786 4 Claims

1. A method for unloading a plurality of at least four large containers, each of the type including a floor, a right side wall, a left side wall, a front wall and at least one bottom rail affixed to the floor from a trailer to the ground by moving the trailer, the trailer being of the type having at least one main rail having a top surface and a plurality of rollers rotatively secured to the main rail comprising the steps of

positioning a first portion of at least two of the containers upon a forward part of the trailer and supporting a bottom rail of only one of the containers on some of the rollers;

nesting the first portion of containers prior to moving, the nest comprising revolving the said container not having its bottom rail on the rollers and resting a sidewall of the said container upon the floor of the container having its bottom rail supported on the roller;

positioning a second portion of at least two of the containers upon a rearward part of the trailer and supporting a bottom rail of only one of the second portion of the containers upon others of the rollers;

rearwardly moving the trailer a short distance and suddenly stopping the rearwardly moving trailer; and

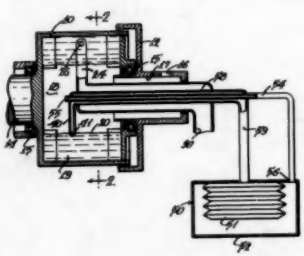
moving the first and second portions of the containers on the rollers relative to the trailer when the rearward trailer movement stops, and moving all of the containers off of the trailer.

4,679,980

GRAVITY INSENSITIVE INVENTORY CONTROL DEVICE FOR A TWO-PHASE FLOW SYSTEM

Timothy J. Bland, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1984, Ser. No. 686,982
Int. Cl.[4] B04B *11/02*; B01D *19/00*
U.S. Cl. 415—24 12 Claims



11. A liquid inventory control device for a flow system wherein said liquid changes phase to a vapor and back and a pitot pump separates vapor from liquid and pumps the liquid to a component of the flow system comprising, a liquid storage device for storing liquid under pressure, a tube positioned within the pitot pump and in open communication with the

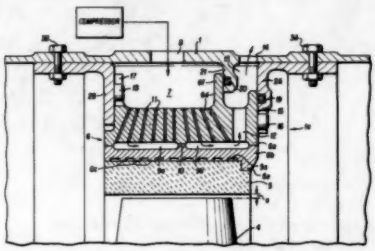
liquid storage device, and said tube having an opening positioned within the pitot pump at a location to establish a desired liquid level in the pitot pump and at which level the pressure at the pitot tube inlet will equal the liquid pressure at the liquid storage device.

4,679,981

TURBINE RING FOR A GAS TURBINE ENGINE

Alain J. E. Guibert, Savigny le Temple; Roland R. Mestre, Melun, and Remy P. C. Ritt, Vaux Le Penil, all of France, assignors to S.N.E.C.M.A., Paris, France

Filed Nov. 15, 1985, Ser. No. 798,318
Claims priority, application France, Nov. 22, 1984, 84 17775
Int. Cl.[4] F04D *29/58*
U.S. Cl. 415—116 7 Claims



1. A turbine ring for a gas turbine comprising:

a turbine casing;

an annular metallic carrier mounted within the casing;

a one-piece ring of ceramic abradable material mounted within the annular carrier, said carrier having means for reducing heat transfer from said ceramic ring to said carrier and means for applying a compression force to the ceramic ring under all operational phases of the gas turbine;

means connected to a bleed of a compressor of said gas turbine for supplying cooling fluid to the annular carrier; and

means for regulating the supply of cooling fluid to the annular carrier, whereby only the temperature of the annular carries is controlled,

wherein said means for reducing heat transfer includes means for providing a small cross-section of contact between said ceramic ring and said carrier, said means for providing a small area of contact comprising a plurality of projections which extend radially between juxtaposed surfaces of the ceramic ring and the annular carrier, and

wherein said means for suppying cooling fluid to the annular carrier lacks means to cool directly other parts of the turbine ring and comprises:

(a) fluid distribution chamber means defined by the turbine casing and an annular outwardly opening casing of the annular carrier,

(b) cavity means in the annular carrier adjacent a radially inner surface thereof,

(c) aperture means in the annular carrier for providing communication between the distribution chamber means and said cavity means, and

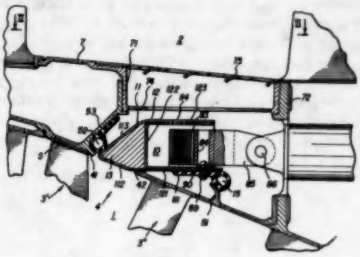
(d) exhaust duct means for exhausting the fluid from said cavity means, said exhaust duct means comprising an opening in said turbine casing, and annular collection chamber in said turbine casing and communicating said annular collection chamber with said cavity means.

4,679,982

COMPRESSOR BLOW-OFF ARRANGEMENT

Jean G. Bouiller, Brunoy, and Gérard E. A. Jourdain, Saintry sur Seine, both of France, assignors to Société Nationale d'Etude et de Construction de Moteur d'Aviation "S. N. E. C. M. A.", Paris, France

Filed Sep. 6, 1985, Ser. No. 773,226
Claims priority, application France, Sep. 6, 1984, 84 13694
Int. Cl.[4] F04D *27/02*
U.S. Cl. 415—145 9 Claims



1. An axial flow compressor of a turbo-jet engine, comprising:

a compressor casing,

means defining inner and outer walls of the air flow path having an annular opening therein for controlled blow-off of the air flow,

an annular movable assembly for opening and closing the said annular opening, and

means supporting the annular assembly on the compressor casing, said support means comprising a resiliently deformable body with

at least one elastomer plate, and

at least two rigid plates secured to opposed faces of the elastomer plate,

one of the rigid plates being secured to the annular assembly and the other rigid plate being rigid with the said casing,

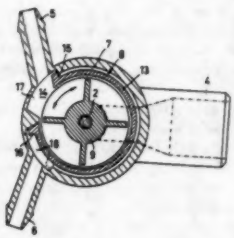
all the plates lying in planes parallel to the direction of movement of the annular assembly.

4,679,983

WATER PUMP FOR WINDOW WASHER UNIT

Erwin Pietryk, Cologne, and Axel Rauthmann, Pulheim, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 594,517, Mar. 29, 1984, abandoned.
This application Jul. 10, 1986, Ser. No. 883,449
Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317155
Int. Cl.[4] F01D *1/30*
U.S. Cl. 415—152 A 2 Claims



1. A water pump for a window washer unit of a vehicle, the

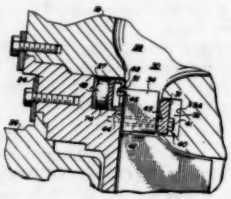
pump having a reversible motor, one inlet port and two outlet ports and being arranged to deliver water selectively to either one of the outlet ports in dependence upon the direction of rotation of the motor, wherein the pump comprises an impeller rotatable in a pump housing and a valve body surrounding the impeller, defining the outer periphery of the pump outlet from the impeller, and movable in dependence upon the direction of rotation of the motor to close the other of the two outlet ports, the valve body being in the form of a drum having a slotted hub which is urged by a clamping ring into frictional engagement with the drive shaft to constitute a slipping clutch, and the outer surface of the drum having at least one radially projecting stop cooperating with abutments in the pump housing to define predetermined end positions for the drum in which a radial opening in the drum is selectively aligned with one or the other of the two outlet ports and the remaining outlet port is closed off by the drum.

4,679,984

ACTUATION SYSTEM FOR VARIABLE NOZZLE TURBINE

William R. Swihart, Torrance, and Edwin R. Deacon, Rolling Hills Estates, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 11, 1985, Ser. No. 807,916
Int. Cl.[4] F01B *25/02*
U.S. Cl. 415—163 **28 Claims**



1. A turbocharger, for use in association with an engine, comprising:

an exhaust gas driven turbine rotatably mounted to a shaft having a compressor impeller thereon;

a compressor housing enclosing said compressor impeller;

a center housing including bearing means for rotatably supporting the shaft;

a turbine housing forming a volute therein for directing exhaust gas from said engine to said shaft;

a backplate mounted between said center housing and said turbine housing and defining an annular cavity therearound;

an annular unison ring positioned within said annular cavity of said backplate;

a turbine side wall, independent of said turbine housing, said side wall defining one side of an annular passage, said unison ring and backplate defining the other side;

a plurality of vanes pivotably mounted between said backplate and said turbine side wall;

means for pivoting said plurality of vanes; and

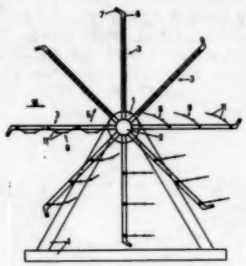
at least three spacers between said backplate and said turbine side wall.

4,679,985

ENERGY CONVERTER

Louis Worms, Fruithoflaan 107-8b Box 114, B-2600 Berchem, Belgium

PCT No. PCT/NL84/00031, § 371 Date May 10, 1985, § 102(e) Date May 10, 1985, PCT Pub. No. WO85/01325, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 17, 1984, Ser. No. 740,068
Claims priority, application Belgium, Sep. 16, 1983, 2/60204
Int. Cl.[4] F03D *3/00*
U.S. Cl. 416—119 **5 Claims**



1. An energy converter, comprising:

a frame;

a rotor mounted in said frame and including

a rotor shaft, and

a plurality of vanes, each of said vanes having two parallel spokes defining a main vane plane passing through the shaft,

a plurality of blades, each of said blades having

a middle leaf, a first adjacent leaf and second adjacent leaf,

first means connecting said middle leaf to said first adjacent leaf and to said second adjacent leaf about first geometrical axes parallel to said shaft, and

second means comprising stops secured to each middle leaf limiting in a first direction the relative hinging of said middle leaf to said first adjacent leaf and the relative hinging of said second adjacent leaf to said middle leaf about said first geometrical axes up to a position wherein said first adjacent leaf, said middle leaf and said second adjacent leaf extend in a single plane,

third means for each of said blades connecting hingedly the first adjacent leaf to said spokes about a second geometrical axis parallel to said shaft, the blades thus hinging relative to said spokes about said second geometrical axis, and

stops on said spokes for each of said blades limiting, in a second direction opposite to said first direction, the relative hinging of said blades about said second geometrical axis; and

an element for connecting the rotor shaft to an energy-converting mechanism.

4,679,986

ENERGY CONSERVING REFRIGERATION APPARATUS AND METHOD

Milburn E. Dupre, 2105 Chapel Dr., Fairborn, Ohio 45324

Filed Nov. 20, 1984, Ser. No. 673,320
Int. Cl.[4] F04B *25/00, 35/00*
U.S. Cl. 417—53 **12 Claims**

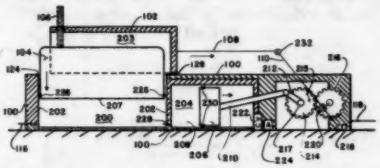
12. A method for compressing a working fluid vapor in a refrigeration cycle comprising the steps of:

moving a compression member away from a home position through a vapor intermediate-pressure compressing stroke

by exposing said compression member to atmospheric pressure;

returning said compression member to said home position with the urging of exposure to a below atmospheric pressure plenum;

applying prime mover derived additional compression to



said vapor, raising said vapor thereby to a pressure corresponding to temperature exceeding the available condensing fluid temperature; and

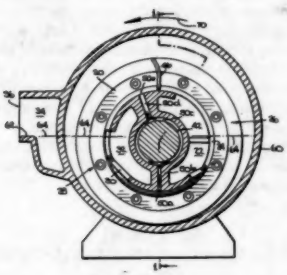
maintaining said below atmospheric pressure at a substantially constant value by intermittently removing leaked atmospheric gases and working fluid vapor from said from said below atmospheric pressure plenum.

4,679,987

SELF-PRIMING LIQUID RING PUMP METHODS AND APPARATUS

Ole B. Olsen, Newtown, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed May 19, 1986, Ser. No. 864,269
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—54 **14 Claims**



1. A liquid ring pump comprising:

an annular housing;

a gas inlet for admitting to the housing gas to be pumped;

a gas outlet for discharging from the housing pumped gas;

a rotor rotatably mounted in the housing for cooperating with pumping liquid in the housing to convey gas from the gas inlet to the gas outlet; and

a bypass conduit extending from an inlet beyond the gas outlet but before the gas inlet in the direction of rotor rotation to an outlet located beyond the gas inlet but before the gas outlet in the direction of rotor rotation, the bypass conduit inlet being located below the level of the pumping liquid with which the pump is supplied prior to being started from a standstill, the bypass conduit outlet being located above said starting pumping liquid level, and the bypass conduit conveying pumping liquid from its inlet to its outlet during start-up to help the pump establish a gas pressure differential between the gas inlet and gas outlet.

10. The method of operating a liquid ring pump having (a) an annular housing; (b) a gas inlet for admitting to the housing gas to be pumped; (c) a gas outlet for discharging from the housing pumped gas; (d) a rotor rotatably mounted in the housing for cooperating with pumping liquid in the housing to convey gas from the gas inlet to the gas outlet; and (e) a bypass conduit extending from an inlet located beyond the gas outlet but before the gas inlet in the direction of rotor rotation to an outlet located beyond the gas inlet but before the gas outlet in the direction of rotor rotation, the bypass conduit inlet being located below the bypass conduit outlet, the method comprising the steps of:

providing in the pump while the rotor is at a standstill a quantity of pumping liquid sufficient to submerge the bypass conduit inlet;

rotating the rotor to create a relatively high pressure in the pumping liquid adjacent to the bypass conduit inlet, and to thereby cause pumping liquid to flow from the bypass conduit inlet through the bypass conduit and out the bypass conduit outlet to help enable the pump to reduce the gas pressure adjacent to the gas inlet relative to the gas pressure at the gas outlet; and

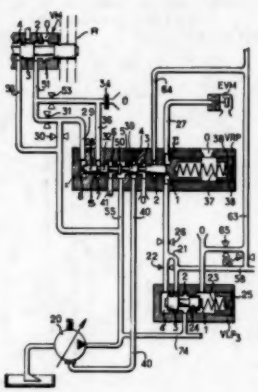
supplying additional pumping liquid to the pump at approximately the gas pressure at the gas outlet so that the reduced gas pressure adjacent the gas inlet is effective to pull the additional pumping liquid into the pump.

4,679,988

TWO-RANGE PRESSURE CONTROL SYSTEM

Francois Leorat, Versailles; Patrick Coutant, Rueil Malmaison, and Paul Aubert, Clamart, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 18, 1985, Ser. No. 777,326
Claims priority, application France, Sep. 18, 1984, 84 14261
Int. Cl.[4] F04B *47/00*; G05D *16/00*
U.S. Cl. 417—218 **10 Claims**



1. A pressure control system comprising:

variable capacity means for providing a hydraulic line pressure; and

means for adjusting said line pressure, comprising:

(a) a pressure control valve,

(b) a first spool movable in said pressure control valve,

(c) spring means in said pressure control valve for biasing said first spool in a first direction,

(d) means for supplying a controlled hydraulic reference pressure to a differential section of said first spool for moving said first spool in a direction opposite said first direction,

(e) means for modulating said reference pressure,

(f) a second spool in said pressure control valve, said second spool being movable in said direction opposite said first direction into contact with said first spool,

(g) means for varying said variable capacity means in response to movement of said first spool,

(h) means for supplying hydraulic pressure to said second spool for moving said second spool in said direction opposite said first direction, comprising:

(i) a first hydraulic line connected to said pressure control valve for supplying hydraulic pressure to said second spool,

(ii) a manual valve movable into two positions for selectively connecting said first line to one of said line pressure and zero pressure,

(iii) a second hydraulic line connected between said first hydraulic line and a source of said line pressure,

(iv) a first restriction in said first line at a position between said manual valve and a point of connection with said second line, and

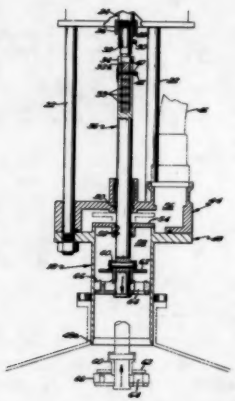
(v) a second restriction in said second line, whereby when said manual valve is in a position for connecting said first line to zero pressure, said first and second restrictions define a hydraulic potentiometer reducing said line pressure.

4,679,989

PUMP SHOVEL BULK UNLOADER

Charles E. Harriman, Bloomingdale, and Donald S. Nii, Arlington Heights, both of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Jul. 16, 1986, Ser. No. 887,023
Int. Cl.[4] F04B *7/04*
U.S. Cl. 417—238 **7 Claims**



1. A pump for pressurizing and transporting materials of varying viscosity, said pump comprising:

a cylinder having an open bottom end;

a piston reciprocally located in said cylinder and having top and bottom surfaces;

a reciprocating source of power;

a connecting rod connecting said piston and said power source, said piston oscillating between top and bottom positions; and

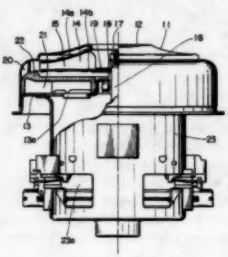
means for adjusting the bottom position of said piston between a first position wherein said piston is located in said cylinder and a second position wherein said piston extends outside said open bottom end.

4,679,990

ELECTRIC BLOWER

Izumi Yamaura, Toyonaka; Masami Fukumoto, Ikeda, and Masao Torigoe, Itami, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 12, 1985, Ser. No. 808,030
Claims priority, application Japan, Dec. 28, 1984, 59-280375; Dec. 28, 1984, 59-280376; Dec. 28, 1984, 59-280409
Int. Cl.[4] F04D *29/66;* F04B *17/00*
U.S. Cl. 417—312 **6 Claims**



1. An electric blower comprising an impeller of the centrifugal type driven by a motor, an air guide having a diffuser including a plurality of divergent passages into which air flow discharged from said impeller flows and a return passage subsequently directing the air flow from said divergent passages into the interior of said motor, a casing having therein said impeller and said air guide, a guide wall forming said return passage comprising inner guide wall sections, outer guide wall sections and spaces interposed between each inner guide wall section and the corresponding outer guide wall section, an opening being formed at the inner terminal end of each of said spaces, the terminal end of each inner guide wall section at the side of the center of said air guide being set to be directed substantially toward the center of said air guide, the terminal end of each outer guide wall section at the side of said air guide being set to be directed to a point intermediate the length of a line connecting said terminal end of said inner guide wall section and the center of said air guide.

4,679,991

SUBMERSIBLE PUMP AND WASTEWATER BASIN APPARATUS

Joe A. Harbison, Gladstone, Mo.; Nyle D. LaGrange, and Darryl M. Nielsen, both of Lenexa, Kans., assignors to The Marley-Wylain Company, Mission Woods, Kans.

Filed Jan. 21, 1986, Ser. No. 820,692
Int. Cl.[4] F04B *17/00, 35/00*
U.S. Cl. 417—360 **11 Claims**

1. A tank mounted discharge conduit assembly for use with a submersible pump unit having an outlet flange comrising:

a base member connected to said tank; and

an upright body having a lowermost end,

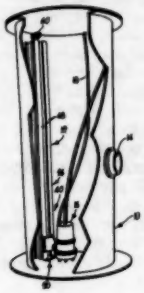
said body having elongated walls defining a fluid conduit extending at least partially through said body and through said lowermost end,

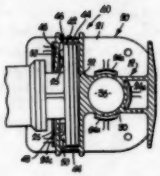
said body having an opening spaced from said end and extending transversely through said walls, said opening being in communication with said conduit,

said base member having an upwardly extending portion complementally received in said conduit adjacent said lowermost end to thereby provide support against lateral deflection of said body,

said body having structure adapted to support said outlet flange of said submersible pump unit in adjacent relation to said opening to thereby establish a fluid flow path from said pump unit, through said opening and to said conduit,

said structure defining an elongated channel for slidably receiving said outlet flange,
said structure including a pair of upright, spaced, U-shaped guides,





said guides having yieldable wall portions for accommodating movement of said flange in a direction generally laterally of the longitudinal axis of said channel.

4,679,992

TURBO-COMPOUND COMPRESSOR SYSTEM

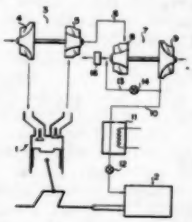
Kinichiro Watanabe, Kanuma; Kunio Horisi, Oyama; Tomoyuki Mashiko, Oyama; Hitoshi Kato, Oyama; Hiromasa Yamaguchi, Oyama, and Toshihiko Nishiyama, Oyama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,374

Claims priority, application Japan, Sep. 29, 1983, 58-149528[U]

Int. Cl.⁴ F04B *17/00*

U.S. Cl. 417—364 **14 Claims**



1. In a turbo-compound compressor system including a booster compressor connected to a power recovery turbine which is disposed downstream of the outlet of an expansion turbine in a turbocharger for an internal combustion engine and drivable by the exhaust gas of said engine, and a rotary positive-displacement air compressor drivable by said engine, the air delivered by said booster compressor being supplied to said rotary positive-displacement air compressor through a pipeline means having a throttle valve, the improvement which comprises a bypass line connected to said pipeline means for preventing surging and having a closing valve.

4,679,993

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

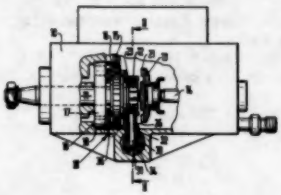
Siegfried Haberland, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,316

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516867

Int. Cl.⁴ F04B *7/06*; F16H *25/08*

U.S. Cl. 417—490 **3 Claims**



1. A fuel injection pump for internal combustion engines, in particular a distributor injection pump, comprising a pump and distributor member that both reciprocates axially and simultaneously rotates within a housing and is rotatably connected to a drive shaft via a coupling, said pump and distributor member further having a cam stroke disk provided with cams arranged to be driven by a drive shaft via a roller ring, said roller ring being rotatable in the housing about a predetermined angle coaxially with the drive shaft and having roller ring rollers through which the cam stroke disk cams are driven, said housing being provided with a stationary support ring which axially supports the roller ring, said stationary support ring having an axis and being provided on a surface thereof which rests on the roller ring with indentations embodied as flutes extending radially with respect to the axis of the stationary support ring.

4,679,994

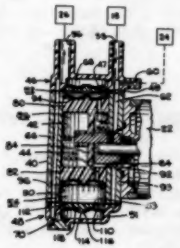
PISTON VACUUM PUMP

George E. Brown, Niles, Mich., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 242,000, Mar. 9, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,891

Int. Cl.⁴ F04B *21/02, 21/04*

U.S. Cl. 417—525 **4 Claims**



3. In a piston pump, the combination of a housing forming a bore, a piston reciprocally disposed within said bore, a pair of covers engageable with said housing to substantially enclose said piston within the bore, said pair of covers cooperating with said housing and said piston to substantially define a pair of variable volume chambers, said piston defining a central

cavity, an input member extending into said central cavity and engaging said piston to impart reciprocating movement thereto, said piston carrying a pair of check valves permitting one way fluid communication between said central cavity and said pair of variable volume chambers, and said housing including an opening for receiving said input member, said opening also providing fluid communication directly between said central cavity and the outside of the bore when said piston is reciprocating, the fluid communication directly between said central cavity and the outside of the bore being primarily through said opening when said piston is reciprocating.

4,679,995

VARIABLE CAPACITY TYPE PUMP WITH DAMPING FORCE ON CAM RING

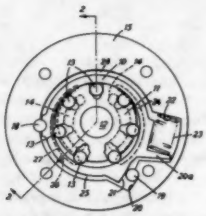
Ian T. Bristow, Higham, England, assignor to Hobourn-Eaton, Ltd., Kent, England

Filed Jul. 5, 1985, Ser. No. 751,974

Claims priority, application United Kingdom, Jul. 5, 1984, 8417148

Int. Cl.[4] F04C 2/344, 15/04

U.S. Cl. 418—26 **6 Claims**



1. A variable capacity pump incorporating inlet and outlet ports and comprising a rotary carrier having slots at its periphery, piston elements mounted in the slots for radial movement, a cam ring encircling the carrier, the radially inner surface of said cam ring being engaged by the piston elements to pump working fluid from the inlet port to the outlet port of the pump, a casing within which the cam ring is mounted for guided movement to adjust the position of the cam ring relative to the axis of rotation of the carrier and hence the output of the pump, resilient means urging the cam ring into a position in which the quantity of fluid delivered is a maximum, means defining between the casing and the cam ring a first chamber communicating with said outlet port, the fluid pressure in said first chamber acting on the cam ring in opposition to the resilient means, and means whereby a damping force is applied to movement of the cam ring which damping force increases with movement of the cam ring to increase the output of the pump and decreases with movement of the cam ring to reduce the output of the pump.

4,679,996

ROTARY MACHINE HAVING SCREW ROTOR ASSEMBLY

Masanori Tanaka, Niigata; Atsushi Machara, Bunsuimachi, and Junichi Kanai, Yoshidamachi, all of Japan, assignors to Hokuetsu Industries Co., Ltd., Nishikanbara, Japan

Filed Jun. 26, 1986, Ser. No. 878,800

Claims priority, application Japan, Jun. 29, 1985, 60-99297[U]

Int. Cl.[4] F04C 18/16

U.S. Cl. 418—201 **3 Claims**

1. A rotary machine having screw rotor assembly comprising a casing having an inner peripheral wall formed by two intersecting cylindrical wall surfaces whose axes are in parallel with each other and two end walls disposed vertically with respect to said axes at each axial end of said inner peripheral wall for forming a closed space in said casing, a male rotor having helical protrusions in the outer periphery thereof and a female rotor having helical concaves in the outer periphery thereof for receiving said protrusions of said mail rotor, said male and female rotors being disposed within said closed space formed in said casing to be rotatable and meshed with each other and an inlet and an outlet ports formed in said casing connected with said closed space formed in said casing, respectively, whereby a compressible fluid introduced in an acting space formed by both said rotors and inner peripheral walls of said casing through said inlet port is compressed or expanded during the rotation of said rotors and is discharged from said outlet port, characterized in that,

a contour line of a tooth profile in a plane perpendicular to a rotating axis of said female rotor is such that a major concave portion except an addundum (Af) formed outside a pitch circle of meshing rotation with the male rotor is formed inside said pitch circle and a contour line of a tooth profile in a plane perpendicular to a rotating axis of said male rotor is such that a major portion except a dedendum (Dm) formed inside a pitch circle of meshing rotation with the female rotor is formed outside said pitch circle;

the tooth profile of the female rotor is formed such that a first portion (G_2-H_2) connecting two outermost points (G_2) and (H_2) located on tip of said addendum (Af) is formed by a circular arc having a radius equal to the outer diameter of said female rotor and a center of the arc being located at a rotating axis of said female rotor; a second portion (H_2-A_2) connecting said point (H_2) and a point (A_2) located on the pitch circle of said female rotor is

generated by a point (A_1) located on the pitch circle of the male rotor tooth profile; a third portion (A_2-B_2) connecting said point (A_2) and a point (B_2) is formed by a convex circular arc having a radius (R_7) and a center (O_7) of the arc being located on a line tangent to the pitch circle of the female rotor at said point (A_2) and outside the tooth profile of the female rotor; a fourth portion (B_2-C_2) connecting said point (B_2) and a point (C_2) is formed by an envelope developed by a circular arc (B_1-C_1) which is a portion of the tooth profile of the male rotor; a fifth portion (D_2-E_2) connecting points (D_2) and (E_2) is formed by a concave circular arc having a radius (R_1) and center (O_1) of the arc being located on a line (3-4) connecting the rotation centers (3) and (4) of the male and female rotors and outside the pitch circle of the female rotor; a sixth portion (C_2-D_2) connecting said points (C_2) and (D_2) is formed by a common tangent or similar concave curve of said fourth portion (B_2-C_2) and fifth portion (D_2-E_2); a seventh portion (E_2-F_2) connecting said point (E_2) and a point (F_2) is formed a convex circular arc having a radius (R_2) and a center (O_2) of the arc being located on an extension of line (O_1-E_2) intersecting at an angle (θ_1) with said line (3-4) at a position opposite to the center (O_1) of the fifth portion (D_2-E_2) with respect to the point (E_2) and an eighth portion (F_2-G_2) is formed by convex circular arc having a radius (R_8) and a center (O_8) of the arc being located on a line connecting said center (O_2) of said seventh portion (E_2-F_2) and said point (F_2);

the tooth profile of the male rotor is formed such that a first

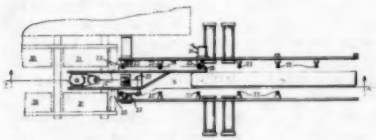
portion (H_1-A_1) connecting a point H_1 located on a bottom land (G_1-H_1) of the dedendum (Dm) and the point (A_1) located on the pitch circle of the male rotor is a generated curve of the point H_2 located on the female rotor tooth profile; a second portion (A_1-B_1) connecting said point (A_1) and a point (B_1) is formed by an envelope developed by said the arc of said third portion (A_2-B_2) of the female rotor tooth profile; a third portion (B_1-C_1) connecting said point (B_1) and a point (C_1) is formed by a convex circular arc having a radius (R_4) and a center (O_4) of the arc being located on a line (3-O_4) intersecting at an angle (θ_5) with said line (3-4) connecting the rotating centers (3) and (4) of said male and female rotors and at a predetermined distance apart from said line (3-4); a fourth portion (E'_1-E_1) connecting points (E'_1) and (E_1) is formed by an envelope developed by said arc of said fifth portion (D_2-E_2) of the female rotor tooth profile; a fifth portion (E_1-F_1) is formed by an envelope developed by said seventh portion (E_2-F_2) of the female rotor tooth profile, a sixth portion (F_1-G_1) is formed by an envelope developed by said eighth portion (F_2-G_2) of the female rotor tooth profile and a seventh portion (C_1-E'_1) is formed such that a portion (E'_1-D_3) connecting said point (E'_1) and a point (D_3) is formed by a convex circular arc having a radius (R_6) and a center (O_6) of the arc being located on a line (3-O_6) intersecting at an angle (θ_6) with said line (3-4) which is tangent to said fourth portion (E'_1-E_1) at the point (E'_1); a portion (C_1-WL_1) connecting said point (C_1) and a point (WL_1) located at a predetermined distance apart from said line (3-4) and on the same side with the point (C_1) with respect to said line (3-4) which is tangent to said third portion (B_1-C_1) at the point (C_1); a portion (D_3-WL_2) connecting said point (D_3) and point (WL_2) located at a predetermined distance apart from said line (3-4) and on the same side with the point (D_3) with respect to said line (3-4) which is tangent to said circular arc (E'_1-D_3) at the point (D_3); a portion (WD_1-WD_2) connecting two points (WD_1) and (WD_2) located on a circular arc having similar radius with the outer radius of the male rotor and a center of the arc being located on the rotating center of the male rotor and located opposite positions with resepct to said line (3-4) is formed by a line intersecting said line (3-4), and line (WD_1-WL_1) connecting said points (WD_1) and (WL_1) and line (WD_2-WL_2) connecting said points (WD_2) and (WL_2), respectively, are formed by a line whereby a seal strip portion formed by said portions (C_1-WL_1), (WD_1-WL_1), (WD_1-WD_2), (WD_2-WL_2) and (D_3-WL_2) is provided on the tip of the male rotor tooth profile.

4,679,997

APPARATUS FOR DELIVERING LABELS TO BLOW MOLDS OF A PLASTIC CONTAINER BLOWING MACHINE AND REMOVING THE BLOWN CONTAINERS WITH THE LABELS THEREON

John A. Plenzler; Thomas J. Krall, both of Toledo, and Casimir W. Nowicki, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1985, Ser. No. 801,441
Int. Cl.[4] B29C *49/24*
U.S. Cl. 425—126 R **11 Claims**



1. An apparatus for applying labels in a blow molding apparatus which comprises a mold having mold halves that are moved between an open position and a closed position defining a mold cavity against which a plastic parison is blown to define a hollow plastic container wherein the apparatus precludes access to the upper or lower ends of the mold halves, said apparatus further comprising

a carriage,

means for supporting said carriage for reciprocating movement along an axis,

means for horizontally reciprocating said carriage between a first position externally of the blow mold halves and a second position between the blow mold halves when the blow mold halves are open,

a first magazine positioned at said first position,

a first label pick-up device,

means for supporting said first label pick-up device on said carriage for movement transversely of the direction of movement of the carriage,

means on said carriage for moving said first label pick-up device transversely outwardly to pick up a label when the carriage is at said first position adjacent said label magazine and for moving said first label pick-up device with a label thereon transversely outwardly when the carriage is at the second position for delivering a label to the cavity of the open mold

a first container removal device including gripping elements for engaging a first blown container formed in the mold,

means for supporting said first container removal device on said carriage for movement transversely of the direction of movement of the carriage toward and away from the axis of movement of the carriage,

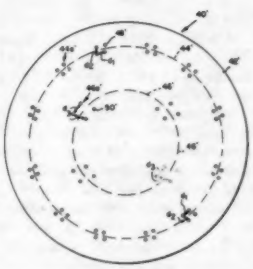
means on said carriage for moving said gripping elements of said first container removal device outwardly and inwardly such that when the carriage is at said second position, said gripping elements of said first removal device can be moved inwardly toward one another to grip the first blown container prior to delivery of a label to the open mold such that upon movement of said carriage toward the first position, the first blown container is removed from the open mold after which the open mold may be closed about another parison delivery to the open mold having a label thereon for subsequent blowing of said another container when the mold is closed.

4,679,998

SPINNERET HAVING GROUPS OF ORIFICES WITH VARIOUS INTERORIFICE SPACING

Richard L. Dreibelbis, and Oliver L. Hunt, both of Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 671,920, Nov. 15, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 887,946
Int. Cl.[4] D01D *5/04*
U.S. Cl. 425—72 S **7 Claims**



1. A spinneret for the production of spandex filaments extruded into a stream of hot inert gas surrounding the filaments and flowing cocurrently therewith comprising a plate having an outer ring and ah inner ring of circumferentially spaced

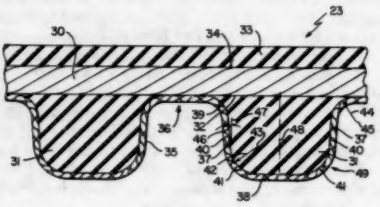
grouped orifices, each group being comprised of a plurality of orifices spaced from each other, the distance between orifices in each group in the outer ring of groups being less than the distance between the orifices in each group in the inner ring of groups.

4,679,999

SYNCHRONOUS DRIVE SYSTEM AND METHOD OF MAKING THE SAME

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 671,392, Nov. 15, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,257
Int. Cl.[4] F16G 1/28; F16H 7/02
U.S. Cl. 474—153 30 Claims



1. In the combination of a toothed pulley and a toothed belt that has the teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal cross-sectional configuration that defines a pair of spaced side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center, the improvement wherein said teeth of said pulley and said belt are so constructed and arranged that each belt tooth would have said pair of spaced apart free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has its said center spaced from said bottom of the cavity between those respective adjacent pulley teeth if that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

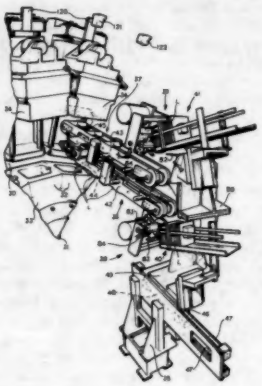
16. In the method of making the combination of a toothed pulley and a toothed belt that has the teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal cross-sectional configuration that defines a pair of spaced side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center, the improvement comprising the step of forming said teeth of said pulley and said belt to be so constructed and arranged that each belt tooth would have said pair of spaced apart free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has its said center spaced from said bottom of the cavity between those respective adjacent pulley teeth if that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

4,680,000

APPARATUS FOR APPLYING LABELS IN THE MOLDS OF A PLASTIC BLOW MOLDING MACHINE

Casimir W. Nowicki, Sylvania; Thomas A. Lucius, Toledo; Ronald S. Kaminski, Bowling Green, and Robert P. Snyder, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1985, Ser. No. 802,117
Int. Cl.[4] B29C 49/24
U.S. Cl. 425—126 R 63 Claims



1. In a blow molding apparatus comprising a plurality of sets of mold sections on a wheel rotatable about a horizontal axis wherein the mold sections are relatively moved radially toward and away from one another and when closed define a cavity which encloses a parison and the parison is then blown to the confines of the cavity between the mold sections as the wheel rotates, a first in-mold labeling apparatus comprising

a first source of labels,

first endless conveyor means having a first end extending from said first source of labels and a second end extending to a position adjacent a path of said open mold sections,

first label pickup means adjacent the first source of labels for taking labels successively from the first source and delivering said labels to the first conveyor means,

said first conveyor means being operable to receive labels from said first label pickup means adajcent the first end successively and carry the labels in a first path to the second end,

first label placement means adjacent the second end of the first conveyor means, said first label placement means being positioned in the path of the open mold sections for successively removing labels from said first conveyor means and delivering said labels to a first section of each set of open mold sections and,

first means for intermittently driving said first conveyor means carrying a series of labels in a direction to receive labels from said first label pickup means and to transfer the labels successively to said first label placement means.

21. In a blow molding apparatus comprising a plurality of sets of mold sections on a wheel rotatable about a horizontal axis wherein the mold sections are relatively moved radially toward and away from one another and when closed define a cavity which encloses a parison and the parison is then blown to the confines of the cavity between the mold sections as the wheel rotates, an in-mold labeling apparatus comprising

a first in mold applying mechanism and a second in mold label applying mechanism associated with each mold section,

each first and second in mold label applying mechanism comprising

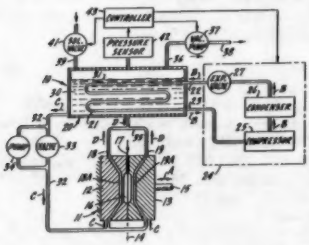
a source of labels,
a conveyor extending from each said source of labels to a position adjacent the open mold sections,
a label pickup mechanism adjacent each source of labels for taking labels successively from each said source of labels and delivering them to a first end of respective first and second conveyor,
a label placement mechanism adjacent a second end of each conveyor positioned in a path of the open mold sections for successively removing labels from a respective conveyor and delivering said labels to a respective mold section, and
means individual to each conveyor for intermittently driving said conveyor in a direction to receive labels from its respective label pickup mechanism and transfer labels in a path successively to its respective label placement mechanism.

4,680,001

PASSIVE MOLD COOLING AND HEATING SYSTEM

Michael A. Waters, Elk Grove Village, Ill., assignor to Application Engineering Corporation, Wood Dale, Ill.

Division of Ser. No. 675,877, Nov. 28, 1984, Pat. No. 4,623,497.
This application Feb. 10, 1986, Ser. No. 827,827
Int. Cl.[4] B29C *33/04*
U.S. Cl. 425—144 **11 Claims**



1. A passive cooling system for cooling a mold for molding articles of plastic material without substantial pumping, the mold including a plurality of vertically extending internal passages for passing a cooling fluid through the mold, the system comprising:
a condenser heat exchanger partially filled with a supply of cooling fluid in a liquid state, the cooling fluid constituting a fluid which changes from its liquid state to its vapor state in response to temperatures occurring in critical portions of the mold passages during operation of the mold, the heat exchanger being positioned so that the upper level of liquid fluid in the heat exchanger is approximately at or above the tip of the mold;
an inlet conduit connecting the heat exchanger, from a point below the upper level of the fluid, to the lower ends of the mold passages;
a return conduit connecting the upper ends of the mold passages back to the heat exchanger;
the heat exchanger, the mold passages, and the inlet and return conduits constituting a closed loop;
and heat exchanger control means for controlling operation of the heat exchanger to maintain a controlled pressure in the loop while condensing vaporized fluid back to its liquid state as the fluid returns from the mold to the heat exchanger;
the heat exchanger control means including means to adjust the controlled pressure to establish a minimum limit temperature for cooling of the mold and means for actuating the heat exchanger to vary the loop pressure in synchronism with the molding cycle.

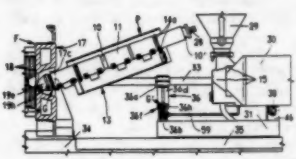
7. A passive heating system for heating a mold for molding articles of plastic material without substantial pumping, the mold including a plurality of vertically extending internal passages for passing a heating fluid through the mold, the system comprising:
an evaporator heat exchanger partially filled with a supply of heating fluid in a liquid state, the heating fluid constituting a fluid which changes from its vapor state to its liquid state in response to temperatures occurring in critical portions of the mold passages during operation of the mold, the heat exchanger being positioned so that the upper level of liquid fluid in the heat exchanger is approximately at or below the bottom of the mold;
an inlet conduit connecting the heat exchanger, from a point above the upper level of the fluid, to the upper ends of the mold passages,
a return conduit connecting the lower ends of the mold passages back to the heat exchanger;
the heat exchanger, the mold passages, and the inlet and return conduits constituting a closed loop;
and heat exchanger control means for controlling operation of the heat exchanger to vaporize fluid from the liquid supply in the heat exchanger to maintain the conduits and the mold passages filled with fluid vapor at a controlled pressure;
the heat exchanger control means including means to adjust the pressure to establish a maximum limit temperature for heating of the mold and means for actuating the heat exchanger to vary the loop pressure in synchronism with the molding cycle.

4,680,002

INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lossburg 1, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,148
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513410; Jan. 28, 1986, 3602439
Int. Cl.[4] B29C *45/62*
U.S. Cl. 425—186 **19 Claims**



1. In an injection molding machine having a generally horizontal axis, including an injection molding unit, an injection mold assembly, a mold closing unit receiving said injection mold assembly, and a first drive means for inserting said injection molding unit in and withdrawing said injection molding unit from said injection mold assembly; said injection molding unit including a plasticizing cylinder having a frontal end insertable into said injection mold assembly and a rear terminus; a feed screw rotatably and axially displaceably accommodated in said plasticizing cylinder, a carrier block form-fittingly receiving said plasticizing cylinder at the rear terminus thereof, immobilizing means for axially fixing the position of said plasticizing cylinder in said carrier block, second drive means for imparting axial injection strokes to said feed screw and a third drive means for rotating said feed screw; the improvement wherein said plasticizing cylinder, together with said feed screw accommodated therein, is capable of being moved by said first drive means into a released position in which said plasticizing cylinder is slightly withdrawn from said injection mold assembly and is separated from said carrier block; the improvement further comprising a first support means situated adjacent said injection mold assembly for sup-

porting said plasticizing cylinder at said frontal end thereof; and a second support means situated at a distance from said first support means for axially supporting said plasticizing cylinder at said rear terminus thereof; said first and second support means upwardly freely removably supporting said plasticizing cylinder in said released position thereof.

4,680,003

APPARATUS FOR THE PRODUCTION OF MOLDINGS FROM FLOWABLE REACTIVE COMPONENTS

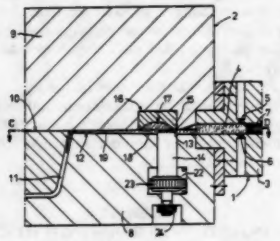
Klaus Schulte, and Heinrich Ersfeld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,254

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500235

Int. Cl.[4] B29C *39/26, 45/30*

U.S. Cl. 425—206 **5 Claims**



1. An apparatus for producing moldings from flowable reactive components comprising

(a) a mold assembly having two halves surrounding a mold cavity,

(b) a mixing device for combining said reactive components mounted on said mold assembly, said mixing device having a mixing chamber,

(c) a supply channel in said assembly for supplying said components from said mixing chamber to said mold cavity,

(d) a throttle device located between said mixing chamber and said mold cavity, said throttle device capable of moving into and out of said supply channel in a direction transverse to the orientation of said supply channel, thereby forming a throttle zone in said supply channel,

(e) a relaxation chamber located in said supply channel between said throttle device and said mold cavity, said apparatus further characterized in that the dividing plane which separates the mold assembly into halves extends through said supply channel, said throttle zone and said relaxation chamber.

4,680,004

METHOD AND APPARATUS FOR CONTROLLING GASOLINE VAPOR EMISSIONS

John H. Hirt, Fullerton, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Filed Mar. 4, 1986, Ser. No. 836,097

Int. Cl.[4] F23G *7/06*

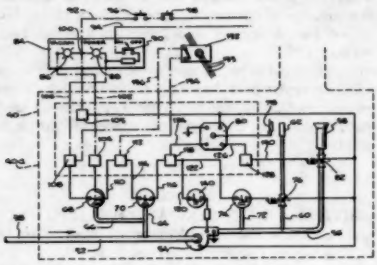
U.S. Cl. 431—5 **6 Claims**

1. In an apparatus for abatement of gasoline vapor emissions from a vent pipe at a gasoline service station or the like in which a vapor piping system interconnects the vent pipe with gasoline storage tanks and gasoline dispensing nozzles in the service station, said apparatus including a pilot burner with pilot ignition means therefore, a main burner with main burner ignition means therefore, at least first and second vapor pressure switches in said vent pipe for sensing and controlling vapor pressure in said vapor piping system; the combination of:

turbine means located downstream from, and controllably activated by said first and second vapor pressure switches for moving vapor in the vapor piping system so as to maintain a partial vacuum in said vapor piping system;

means for sensing the vapor pressure downstream from said turbine means;

means responsive to said downstream vapor pressure sensing means for causing, at a selected vapor pressure down-



stream of said turbine means, admission of vapor to said pilot burner;

means for igniting said vapor at said pilot burner to provide a pilot flame;

means for sensing said pilot flame and upon sensing said pilot flame for causing admission of vapor to the main burner for ignition by said pilot flame.

4,680,005

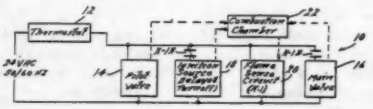
PRIMARY GAS FURNACE CONTROL

Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 627,038, Jul. 2, 1984, Pat. No. 4,626,192. This application Jun. 26, 1986, Ser. No. 879,067

Int. Cl.[4] F23Q *9/08*

U.S. Cl. 431—46 **2 Claims**



1. In a primary control for gas furnaces, the combination including a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit including a thermostatic switch, an electrically operable pilot gas valve, an electrically operable main gas valve, pulse generating means for controlling energization of said main gas valve including a programmable unijunction transistor, and first relay means controlling the energization of said main gas valve and said pulse generating means, a high voltage spark generating circuit including a silicon controlled rectifier and spaced electrodes disposed in the path of gas emanating from said pilot valve, said programmable unijunction transistor controlling the conduction of said silicon controlled rectifier, means interfacing said low voltage circuit and said spark generating circuit and providing a substantially higher voltage in said spark generating circuit than in said low voltage circuit, and flame sensing means including a probe disposed in the path of gas emanating from said pilot valve and being subjected to the heat of the gas flame when gas ignition is obtained by said spark generating circuit whereby flame rectification is effected by said probe, said flame sensing means controlling the energization of said main gas valve and said pulse generating means through said first relay means, said means interfacing said low voltage circuit and said spark generating circuit including

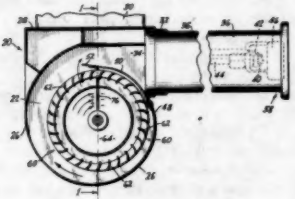
voltage doubler means and step up transformer means, capacitor means operably connected to said pulse generating means and effective to maintain energization of said pulse generating means and said spark generating means for a predetermined period of time after flame rectification is effected by said probe, said low voltage circuit including second relay means controlling the energization of said pilot valve, and means for delaying the energization of said second relay means for a preselected period of time following closure of said thermostatic switch.

4,680,006

BLOWER AUGMENTOR FOR POWER OIL AND POWER GAS BURNERS

Leonard A. Fisher, Granby, Conn., assignor to The Carlin Company, Windsor, Conn.

Filed May 16, 1985, Ser. No. 734,837
Int. Cl.[4] F23Q *3/00*
U.S. Cl. 431—265 **7 Claims**



1. In an oil burner, in combination:

(a) a blower comprising a scroll housing and a driven squirrel cage therein, said squirrel cage having an interior air space, and having blades disposed around said interior air space and constituting an air impeller,

(b) said scroll housing having a tangential air outlet, and further comprising a spiral wall encircling said squirrel cage,

(c) a stationary barrier wall mounted in the housing and extending into the said interior air space of the squirrel cage, said barrier wall extending outward from and with respect to a central axial area of the squirrel cage to a location adjacent the said blades thereof,

(d) said housing being wider than the squirrel cage in axial dimension, thereby to provide an end space between the squirrel cage and the housing, in which end space air tends to recirculate in the housing, and

(e) support and baffle means disposed in the said end space between the housing and squirrel cage, for mounting said barrier wall and for redirecting in outward directions a portion of the circularly travelling recirculating air in the housing.

4,680,007

LIGHTER WITH ADJUSTABLE FLAME

Friedrich Schächter, Draschestrasse 31, Vienna, Austria (A-1232)

Filed Apr. 29, 1985, Ser. No. 728,075
Int. Cl.[4] F23D *13/04*
U.S. Cl. 431—344 **17 Claims**

1. A fuel burning lighter having an adjustable flame height comprising:

burner means;

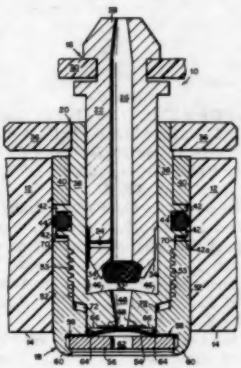
a supply of liquified gaseous fuel;

valve means positioned between said fuel supply and said burner means;

a film having top and bottom generally parallel surfaces and micropores oriented substantially perpendicular to said surfaces, a plurality of said micropores of said film being open to allow passage of fuel, said film positioned between said valve means and said fuel supply in such a manner so that all fuel flowing to said burner means must pass through said open micropores;

means for conducting fuel passing through said film and through said valve means to said burner means; and

control means located downstream of said film comprising



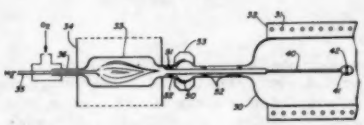
chamber means of adjustable depth whereby selectively increasing or decreasing the depth of the chamber means correspondingly increases or decreases said plurality of open micropores provided by deflection of the film thereby increasing or decreasing the passage of fuel through said film to said burner means so as to provide a flame of desired height.

4,680,008

HIGH TEMPERATURE FURNACE FOR INTEGRATED CIRCUIT MANUFACTURE

Brian A. Rioux, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 8, 1986, Ser. No. 938,903
Int. Cl.[4] F23J *15/00*
U.S. Cl. 432—72 **4 Claims**



1. A high temperature furnace for the growth of oxide layers on silicon substrates and the like, the furnace comprising:

a furnace chamber;

heating means for maintaining the internal temperature of the chamber at a temperature greater than the ignition temperature of a gas mixture; and

a burn chamber external to the furnace chamber for mixing and burning said gas mixture therein;

characterized by:

a tube for conveying the gas mixture from the burn chamber to the furnace chamber;

one end of the tube protruding into the furnace chamber a sufficient distance that the ambient temperature, contiguous an opening in the tube which expels the gas mixture into the furnace chamber, is greater than said ignition temperature, resulting in ignition of the gas mixture in the furnace chamber which creates a flame front that travels back along the tube into the burn chamber, to initiate and sustain ignition

the burn chamber and the furnace chamber are joined at a mating ball-and-socket joint; and

the other end of the tube is flared and clamped between the mating ball-and-socket joint.

4,680,009

APPARATUS FOR REMOVING OVERSIZE FROM THE HOT MATERIAL DISCHARGED FROM A ROTARY KILN USED TO PRODUCE SPONGE IRON BY A DIRECT REDUCTION OF IRON OXIDE CONTAINING MATERIALS

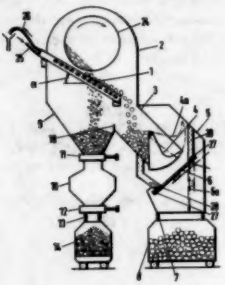
Helmut Ernst, Offenbach am Main; Alfred Breier, Frankfurt am Main; Manfred Schwalbach, Florsheim; Karl-Heinz Will, Oberursel, all of Fed. Rep. of Germany; Alan B. Cameron, Manurewa, and Peter C. Bates, Waiuku, both of New Zealand, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany and New Zealand Steel Ltd, Auckland, New Zealand

Filed Aug. 1, 1986, Ser. No. 893,113

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527621

Int. Cl.[4] F27B *7/32*

U.S. Cl. 432—117 **7 Claims**



1. In an apparatus for removing oversize from hot material discharged from a rotary kiln used to produce sponge iron by a direct reduction of iron oxide containing materials, the apparatus comprising a stationary kiln head which surrounds and is gas-tightly sealed to a discharge end of a rotary kiln, an oversize discharge device on the kiln head, and a discharge device for the particles which have passed through a sieve-like separator, the improvement wherein: the sieve-like separator comprises a rigid, inclined grate, means for cooling the grate and further comprising: a collecting container for collecting oversize mounted on the kiln head and having a gate valve at the discharge end thereof, an outer container surrounding and gas-tightly sealed to the collecting container and having a gas-tight flap valve, a transport container, a fitting for a gas-tight connection between the collecting container and the transport container, wherein the kiln head is configured to form at least one buffer bin under the grate for the particles falling through the grate, a batching bin under the buffer bin and having a gas-tight upper shutoff valve, a second transport container, the batching bin having: on its discharge side a gas-tight lower shutoff valve with a fitting for a gas-tight connection to the second transport container, and wherein the volume of the batching bin is smaller than the volume of the second transport container.

4,680,010

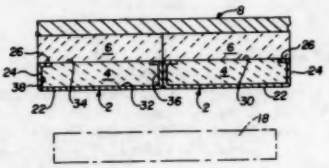
RE-RADIATING HEAT SHIELD ASSEMBLY

Vladimir B. Ginzburg, and Winfried F. Schmiedberg, both of Pittsburgh, Pa., assignors to Wean United Rolling Mills, Inc. and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 778,522

Int. Cl.[4] F28F *13/00*

U.S. Cl. 432—148 **5 Claims**



1. A heat shield assembly for re-radiating heat comprising

an array of thermal insulating blocks disposed in generally side-by-side adjacency,

said thermal insulating blocks having a pair of faces and an adjacent lateral surface,

a plurality of thermal conducting sheets having first portions covering said first faces of said thermal insulating blocks and second portions covering said adjacent lateral surfaces of said thermal insulating blocks, whereby said first faces and said adjacent lateral surfaces will not be exposed directly to a heat source positioned adjacent to said array thereby reducing losses due to radiation emitted from the heat source,

said thermal conducting sheets having third portions covering at least a portion of said second faces of said thermal insulating blocks,

a second array of thermal insulating blocks disposed adjacent said second faces of said first array,

said thermal conducting sheets composed of a ferrous material, and

said first portions of said thermal conducting sheets having an area of about 50 to 70 percent of the area of said thermal conducting sheets contained within said lateral portion and said third portions thereof.

4,680,011

DENTAL CONTRA-ANGLE HANDPIECE WITH MEANS FOR ILLUMINATING THE TREATMENT AREA

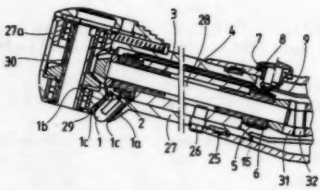
Jean-Claude Boinot, Roulans, France, assignor to Micro-Mega S.A., Besancon, France

Filed Mar. 26, 1986, Ser. No. 844,356

Claims priority, application France, Mar. 27, 1985, 85 05016

Int. Cl.[4] A61C *1/00*

U.S. Cl. 433—29 **19 Claims**



1. A dental contra-angle handpiece having means for illuminating the treatment area comprising: a front part including a head having a tool holder therein for clamping a tool, and at least one miniature bulb disposed on the head and having a central contact; a handle detachably connected to said front part at a front end of the handle and provided with matching

contact means on a rear end of the handle; a rotary shaft mounted in said front part for driving said tool; insulating support means disposed in said front part for rotatively supporting the rotary shaft; a rear socket fitted to the rear end of said handle and provided with electric contact means disposed to engage with the matching contact means for supplying electric power to said bulb; electrical connection means for electrically connecting the central contact of said bulb to the matching contact means comprising a front metal ring electrically connected to the central contact of the bulb, a rear metal ring electrically connected to the front metal ring, said front and rear metal rings being axially spaced from each other and mounted on the insulating support means , and a spring blade mounted in said handle and electrically connected to the matching contact means and extending axially at a junction between said front part and said handle, said spring blade being spaced from said rear metal ring when the front part and the handle are assembled with each other; and a switch mounted on said handle adjacent to said spring blade, said switch being operative to move said spring blade for engagement with said rear metal ring and thus close the electrical connection means.

4,680,012

PROJECTED IMAGED WEAPON TRAINING APPARATUS

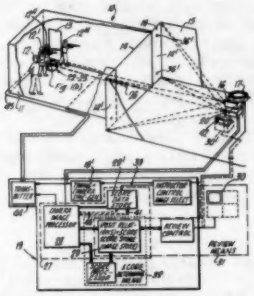
Robert A. Morley, Southport, and James M. Buick, Stockport, both of England, assignors to Ferranti, plc, Cheadle, England

Filed Jun. 12, 1985, Ser. No. 743,803

Claims priority, application United Kingdom, Jul. 7, 1984, 8417402; Jan. 28, 1985, 8502110

Int. Cl.[4] F41G *3/26*; F41J *5/10*

U.S. Cl. 434—22 **14 Claims**



1. Weapon training apparatus including a high optical transmission back-projection screen of high optical transmissivity; image projection means operable to form a visible target image on the screen by back-projection, said image including one or more datum points; means for changing the projected image; weapon sighting means, directable at the front of the screen by a trainee in a training area, including a weapon discharge trigger mechanism and an optical radiation emitter responsive to operation of the trigger mechanism to direct optical radiation at the screen to impinge thereon in a spot indicative of a simulated projectile impact point; a television camera, located on the same side of the screen as the projector and having a field of view substantially co-extensive with the image projected by the projector, operable to receive at least a part of the projected target image, reflected from the screen, and radiation forming said impact simulating spot, transmitted by the screen, simultaneously as a composite image; and scoring analysis means comprising image processing means operable to determine from the camera video signal the positional relationship between the impact simulating spot and said datum points defined on the camera-viewed target scene, data storage means operable to store data pertaining to said positional relationship and review means including the screen and means to cause said projector to project onto the screen for viewing an image of said target scene including the impact simulating spot in the positional relationship therewith determined by the image processing means.

4,680,013

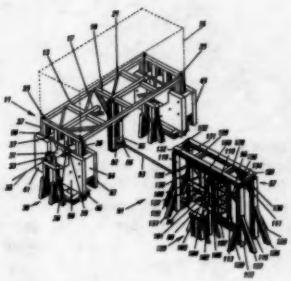
SHIPBOARD TRANSPORTATION SIMULATOR AND BREAKBULK CARGO TABLE THEREFOR

Mansour Z. Boutros, R.R. 1, Box 121, Thomson, Ill. 61285

Filed Nov. 15, 1982, Ser. No. 441,843

Int. Cl.[4] G09B *9/06*

U.S. Cl. 434—29 **13 Claims**



1. A shipboard transportation simulator for moving a cargo container in a wave-like simulation, said cargo container having a cargo center of gravity, said simulator comprising:

a simulator frame;

means for supporting said frame for movement about a real axis;

means for driving said frame in movement about said axis;

means on said frame for supporting said cargo container with said cargo center of gravity above said axis;

said cargo and frame having a combined center of gravity; and

means on said frame for balancing the moment about said axis of the cargo center of gravity for locating said combined center of gravity substantially at said axis;

whereby said cargo container may be tested upon said simulator by reverse pendulum harmonic motion.

4,680,014

WELDER'S TRAINER

Boris E. Paton; Vsevolod V. Vasiliev; Valentin A. Bogdanovsky; Alexandr I. Baranov; Sergei N. Danilyak, all of Kiev; Viktor A. Schegolev, Moskovskaya; Vladimir A. Chernoivanov, Kaliningrad; Vitaly I. Voloshin, Zhitomir; Viktor M. Gavva, and Vsevolod N. Bernadsky, both of Kiev, all of U.S.S.R., assignors to Institute Problem Modelirovania v Energetike a An USSR, Kiev, U.S.S.R.

Filed Nov. 26, 1985, Ser. No. 801,873

Int. Cl.[4] G09B *19/24*

U.S. Cl. 434—234 **31 Claims**

1. A welder's trainer comprising:

a welding situation simulation unit having an input and made in the form of a TV-type display having a screen:

a welding electrode simulator having an input and an output;

a welding process heat balance electronic model having an input and an output;

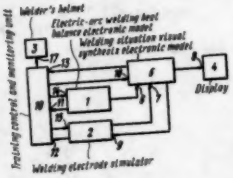
a welding situation visual synthesis electronic model having inputs and a first and second outputs;

said first output of said visual synthesis electronic model connected to said display;

a training control and monitoring unit having first, second and third inputs and a first output, said first output con-

nected to said input of said welding electrode simulator, a second output connected to said input of said heat balance electronic model and a third output connected to said input of said visual synthesis electronic model, said first input connected to the output of the welding electrode simulator, said second input connected to the output of the heat balance electronic model and said third input connected to the second output of the visual synthesis electronic model, in which said welding situation simulation unit is connected to said visual synthesis electronic model that provides an electronic model for visual synthesis of the welding situation on the display screen that is part of said welding situation simulation unit;

the welding situation simulation unit is connected to the trainer monitoring and control unit through the visual synthesis electronic model.



4,680,015

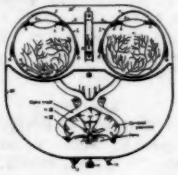
EYE AND BINOCULAR VISION DEMONSTRATOR

Harvey C. Rones, 2078 Irving Ave., Astoria, Oreg. 97103

Filed Sep. 30, 1985, Ser. No. 782,127

Int. Cl.[4] G09B 23/32

U.S. Cl. 434—271 **3 Claims**



1. I claim an eye and bonocular vision demonstrator for demonstrating the binocular focus function of vision, Comprising;

A casing having upper and lower levels; the lower level having means to hold two simulated eyeballs;

A pair of simulated eyeballs, including simulated recti muscles, mounted in the lower level of said casing, said eyeballs each being divided into upper and lower sections, the upper sections being removable and the lower sections containing simulated anatomical features, including lenses;

said lenses being secured with rods extending through simulated ciliary muscles butting against the lenses;

A means in the rear of the casing for turning the eyeballs inward, simulating convergence; and the inward pressure of said rods pushing against the lenses causing the lenses to change their curvature, thereby simulating focus accommodation.

4,680,016

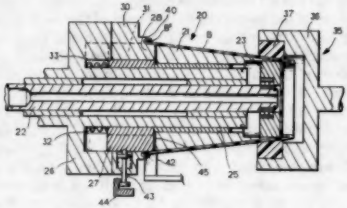
APPARATUS AND METHOD FOR RIMMING CONTAINERS

Bobby R. Lynch, R.R. #2 Box 57, Ozark, Mo. 65721

Filed Jan. 31, 1986, Ser. No. 824,506

Int. Cl.[4] B31B 1/28

U.S. Cl. 493—159 **16 Claims**



1. Apparatus for rimming the open mouth portion of a frustoconically-shaped container blank which includes a rimming die comprising a truncated hollow mandrel member having sloping sides complemental to the tapering sidewalls of the container blank, said mandrel member being mounted on a central shaft for its controlled rotation and axial movement, means for rotating and axially moving said mandrel member with said container blank rotatably mounted thereon, a blank support member within said mandrel, said member mounted for axial movement with said mandrel member and nonrotatively with respect to said central shaft and said mandrel member, and having a radially splined exterior surface complemental to the tapering angle of said container blank sidewalls, a stationary rimming tool member having an annular semi-circular groove adapted to receiving and shaping the open edge of the open mouth portion of said container blank during rimming and a radially splined exterior surface closely adjacent to said annular groove interengagable with said radially splined surface of said blank support member during said axial movement, said combined radially splined exterior surfaces of said blank support member and said rimming tool member being adapted to fully supporting the container open mouth portion during rimming of the open edge.

4,680,017

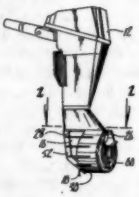
MOTORBOAT PROPELLER GUARD FOR IMPROVED PERFORMANCE

Dennis E. Eller, 814 N. Wooster, Algona, Iowa 50511

Filed Mar. 10, 1986, Ser. No. 838,161

Int. Cl.[4] B63H 5/16

U.S. Cl. 440—66 **13 Claims**



1. In combination with a motorboat including a motor, a propeller operatively connected to said motor, a lower housing with opposite leading and trailing edges and terminating in a vertically disposed skeg, said propeller being mounted on said lower housing adjacent said trailing edge and above said skeg, and a pair of horizontally disposed cavitation plates having forward and rearward ends extending laterally from said lower housing and above said propeller, a propeller guard comprising:

a rigid U-shaped sleeve having a forward end and opposite rearwardly extending legs and an elongated U-shaped channel formed therin, said channel having a closed forward end and open rearward ends which extend at least to the rearward ends of said cavitation plates, said open rear ends of said channels having an effective width therebetween substantially equal to the maximum combined width of said pair of cavitation plates whereby said sleeve is adapted to slide rearwardly into position with said legs extending on each side of said lower housing and with said cavitation plates received within said channel until said forward end of said sleeve engages said leading edge of said lower housing to thereby prevent rearward movement of said guard;

means for closing said open rearward ends of said channel and thereby prevent forward movement of said sleeve; and

a propeller shield having open inlet and outlet ends, being attached to said sleeve for encircling said propeller and thereby protecting said propeller from contact with foreign objects,

a frame member extending downwardly from the forward end of said sleeve and engaging said leading edge of said lower housing substantially along the length thereof, and

a plurality of longitudinally disposed ribs extending between said frame member and said shield to further protect said propeller from contact with foreign objects.

4,680,018

RECONFIGURABLE TOY ASSEMBLY

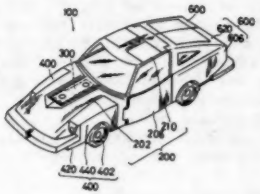
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

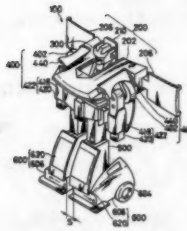
Division of Ser. No. 524,289, Aug. 17, 1983, Pat. No. 4,550,993. This application Apr. 7, 1986, Ser. No. 849,211

Claims priority, application Japan, Oct. 12, 1982, 57-154325[U]; Nov. 5, 1982, 57-167809[U]; Dec. 14, 1982, 57-188580[U]; Feb. 17, 1983, 58-21991[U]

Int. Cl.[4] A63H *3/46, 17/00*

U.S. Cl. 446—376 **10 Claims**





1. A reconfigurable toy assembly having a vehicle configuration in a first position and a robotic humanoid configuration in a second position, comprising:

a first element configured to simulate the front portion of a vehicle in a first position and a robotic humanoid trunk in a second position;

a second element swingably mounted on the upper portion of said first element, said second element being configured to simulate a robotic humanoid head in a second position and received in said first element in a first position;

a pair of third elements pivotally connected to two sides of said first element, said third elements being configured to simulate a lower portion and front wheel portion of a vehicle in a first position and a pair of robotic humanoid arms in a second position;

a pair of fourth elements pivotally connected to the lower portion of said first element, said fourth elements being configured to simulate a pair of robotic humanoid legs in a second position and received in said first element in a first position; and

a pair of fifth elements each pivotally connected to the lower portion of the corresponding fourth element.

4,680,019

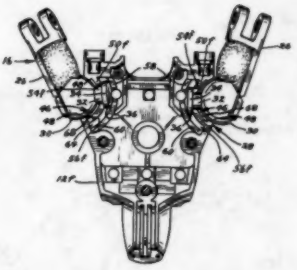
TOY FIGURE WITH INDIVIDUALLY POSABLE LIMBS

Philip M. Baerenwald, Florence, Ky., and Phillip G. Reed, Loveland, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.

Filed Jan. 29, 1986, Ser. No. 823,845

Int. Cl.[4] A63H *3/46*

U.S. Cl. 446—378 **14 Claims**



1. In a toy figure, a torso, a limb, ball means on said limb, a shank element having one end attached to said ball means, a head on the other end of said shank element having outer and inner sides, said outer side being nearer said ball means, seat means associated with said torso, means acting against the outer side of said head to retain said ball means in engagement with said seat means, and resilient rib means integral with said torso frictionally engaging the inner side of said head so as to hold said limb in various angularly adjusted positions.

4,680,020

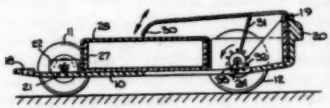
TOY VEHICLE HAVING SIMULATED ENGINE NOISE

Melvin R. Kennedy, 2 Fifth Ave., New York, N.Y. 10011; Dietmar Nagel, 147 South Rd., Chester, N.J. 07930, and Abraham A. Arad, 6 Minuteman Hill, Westport, Conn. 06880

Filed Apr. 14, 1986, Ser. No. 851,461

Int. Cl.[4] A63H *17/34*

U.S. Cl. 446—414 **6 Claims**



1. A motorless, free-wheeling toy vehicle which when pro-

pelled by a player to run at a changing speed makes a repetitive sound simulating the noise of an internal combustion engine as a function of running speed, said vehicle comprising:

A. a chassis having bearings supporting front and rear wheel axles;

B. a miniature sound producing drum having a resonance chamber and a drum head formed of elastic material enclosing the resonance chamber, said drum being mounted on top of the chassis between the wheel axles;

C. a clapper cantilevered from one end of the chassis, said clapper being formed of a flat metal spring terminating in a striker that normally rests on the drum head, said spring having a finger located between the striker and the cantilevered end of the clapper and projecting downwardly therefrom at a position displaced from the drum; and

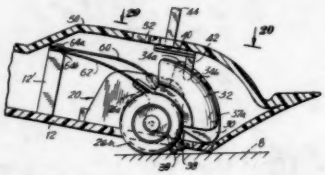
D. a hub mounted on one of said axles, located outside of said resonance chamber, said hub having spaced teeth which when the axle rotates at a rate depending on the running speed then successively engage the tip of the finger, whereby each time the finger is engaged by a moving tooth of the spaced teeth, the finger is pushed forward to raise the striker above the drum head, and when the finger then falls between adjacent teeth, the striker is released to hit the elastic drum head to generate a low-pitched thumping sound, the repetition rate of the clapper action depending on the running speed of the toy vehicle as determined by the player.

4,680,021

MULTI-ACTION TOY VEHICLE

John Maxim, 25 Mill Valley La., North Stamford, Conn. 06903

Filed Aug. 29, 1983, Ser. No. 527,624
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—457 **10 Claims**



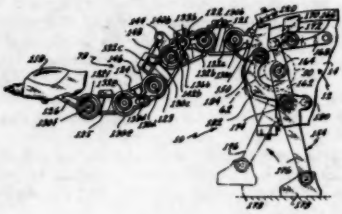
1. A toy vehicle comprising a chassis, wheel means rotatably supported on said chassis for permitting said chassis to roll on a surface, changing means supported on said chassis for changing the center of gravity of said toy vehicle and control means operatively coupled to said changing means for selectively controlling said changing means in responce to manual manipulation thereof, said changing means including weight means movably supported on said chassis, said control means selectively adjusting said weight means to adjust the center of gravity of said toy vehicle, said control means being a lever means coupled to said weight means for selectively positioning said weight means on said chassis, said chassis including a front end and a rear end, said wheel means including at least a first front wheel rotatably supported on said front end of said chassis and first and second rear wheels rotatably supported on the rear end of said chassis, said weight means being supported on said chassis proximate said first and second rear wheels, said weight means including a first weight pivotally supported on said chassis proximate said first rear wheel and a seond weight pivotally supported on said chassis proximate said second rear wheel, said lever means being operatively coupleable to said first and second weights to selectively pivot said first and second weights whereby the center of gravity of said toy vehicle is changed.

4,680,022

TOY LINKAGE

Shiro Hoshino, and Bonpei Fujino, both of Tokyo, Japan, assignors to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,424
Claims priority, application Japan, Feb. 26, 1983, 58-27960[U]
Int. Cl.[4] A63H *11/20*
U.S. Cl. 446—487 **6 Claims**



1. An articulated linkage which comprises:

at least a first link, a second link, a third link and a fourth link pivotally connected to together in a linear array, said second link located between said first and said third link, said third link located between said second and said fourth link;

a plurality of joining means equal to the number of said links minus one, a first of said joining means pivotally connecting said first link to said second link, a second of said joining means pivotally connecting said second link to said third link, a third of said joining means pivotally connecting said third link to said fourth link;

each of said first, said second, said third and said fourth links having an arm member fixedly attached to said respective first, second, third, and fourth links;

said first arm member projecting from said first link across a portion of said second link towards said third link;

said third arm member projecting from said third link across a portion of said second link towards said first link;

said second arm member projecting from said second link across a portion of said third link towards said fourth link;

said fourth arm member projecting from said fourth link across a portion of said third link towards said second link;

a boss on said first arm member;

a slot in said third arm member;

said boss on said first arm member fitting in said slot on said third arm member to operatively connect said first arm member and said third arm member;

a boss on said second arm member;

a slot on said fourth arm member;

said boss on said second arm member fitting in said slot on said fourth arm member to operatively connect said second arm member and said fourth arm member.

4,680,023

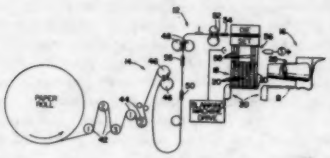
CONTAINER FORMING APPARATUS HAVING IN-LINE BLANKER

Richard F. Varano, Forestville, Conn., assignor to Sherwood Tool, Incorporated, Kensington, Conn.

Filed Apr. 19, 1985, Ser. No. 725,093
Int. Cl.[4] B31B *1/60*
U.S. Cl. 493—75 **15 Claims**

1. Apparatus comprising a paper receptacle forming machine having a receptacle body forming station, a vertically disposed upwardly open magazine for receiving and containing a supply of vertically stacked receptacle blanks and defined at least in part by a plurality of vertically upwardly extending members, and means for feeding successive receptacle blanks from the bottom of a stack of a receptacle blanks in said magazine to said forming station, and a separate portable blanking machine operable independently of said receptacle forming

machine and having blanking means disposed above the level of said magazine for forming a succession of receptacle blanks, and guide means mounted on and depending from said blanking machine for directing from said blanking means into said



magazine receptacle blanks received from said blanking means, said guide means cooperating with said upwardly extending members and forming a substantial upward extension of said magazine.

4,680,024

APPARATUS FOR PRODUCING BAGS FROM A TUBULAR SHEET OF THERMALLY WELDABLE FILM MATERIAL

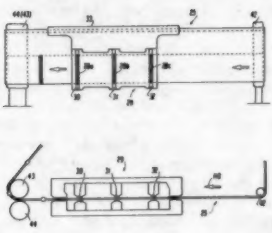
Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,031

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446409

Int. Cl.[4] B31B *23/14, 23/64*

U.S. Cl. 493—197 **21 Claims**



1. Apparatus for producing bags from a continuous tubular sheet of thermally weldable film material which is conveyed in stages by a sheet-drive mechanism, and having welding means including a plurality of welding jaws for welding, in a direction transverse to the conveying direction, in the sheet a plurality of transverse welding seams spaced apart in the conveying direction by a distance corresponding to the width of a bag, characterized in that there are provided:

a sheet-drive mechanism for conveying a thermally weldable film material in stages;

first means for bringing the welding jaws (**30, 31, 32**), during a short stationary phase of the film sheet (**25**), into seam-welding position;

second means for disengaging, after completion of the welding, the welding jaws from said welding position and returning them to a starting position;

jaw-drive means for moving said welding jaws in said conveying direction and in the opposite direction; and

coupling means for coupling the sheet-drive mechanism to said jaw-drive means only when said welding jaws are in the welding position so that said sheet and said welding jaws are moved together in the conveying direction.

4,680,025

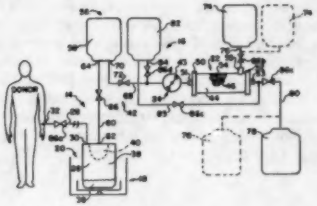
BLOOD COMPONENT COLLECTION SYSTEMS AND METHODS

Robert J. Kruger, Arlington Heights, and Richard I. Brown, Northbrook, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 411,058, Aug. 24, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 833,530

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—6 **4 Claims**



1. A closed blood component collection system comprising

a first portion suited for use with an extracorporeal centrifugal blood processing device, said first portion including

a centrifugation container operative for use with the processing device to undergo centrifugation, and

first branch conduit means connected to said centrifugation container for introducing whole blood from a donor into said centrifugation container for separation therein into red blood cells and platelet-rich plasma in response to centrifugal forces, and

a second portion operative for attachment to pump means and including microporous membrane means operative for filtering the cellular compoinents of blood from the noncellular components of blood,

second branch means connecting the centrifugation container with said microporous membrane means and attachable to the pump means for introducing said platelet-rich plasma into said microporous membrane means for filtration int platelet concentrate and virtually platelet-free plasma,

a first transfer container,

third branch means communicating with said microporous membrane means and said first transfer container for transferring said virtually platelet-free plasm into said first transfer container,

a second transfer container,

fourth branch means communicating with said microporous membrane means and said second transfer container for transferring said platelet concentrate into said second transfer container, and

each of said branch means in said first and second portions of said system comprising a length of flexible tubing integrally connected with said system to form a fluid path which is closed to communication with the atmosphere.

4,680,026

SUCTION-IRRIGATION EQUIPMENT HAVING A RECIPROCATING VALVE

Barry O. Weightman, 26, Basing Way, Thames Ditton, Surrey, and Graham Deane, "Oakwood", Burleigh Rd., Ascot, Berkshire, both of England

Continuation of Ser. No. 730,259, May 6, 1985, abandoned, which is a continuation of Ser. No. 473,505, Mar. 8, 1983, abandoned. This application Mar. 11, 1986, Ser. No. 838,449

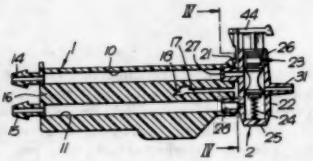
Claims priority, application United Kingdom, Mar. 29, 1982, 8209132

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—33 **5 Claims**

1. Medico-surgical suction irrigation equipment adapted to

be hand held and including a handle; a first bore extending through said handle, said first bore having a pair of spaced ends located respectively adjacent spaced portions of said handle; means for connecting one end of said first bore to a suction source; a second bore extending through said handle in spaced relation to said first bore, said second bore having a pair of spaced ends located respectively adjacent spaced portions of said handle; means for connecting one end of said second bore to a source of irrigating fluid; valve means comprising a valve housing attached to said handle for connecting said valve means with the other ends of said first and second bores; said valve housing having a single outlet port; a valve member within said housing, said valve member being movable between first and second positions in said housing and having a reduced diameter waist section around which fluid flows through said housing in each of said first and second valve member positions, said valve member being connected to a depressible actuator member located adjacent said handle external of said housing; spring means located within said housing, said spring means urging said valve member upwardly in said valve housing to said first position, said valve member being so disposed relative to said handle that said valve member can be displaced downwardly along said housing against the action of said spring means transversely of said bores by pushing down on said actuator member with the finger or thumb of a user of the equipment while said user is holding said equipment at said handle, said downward displacement of the valve member being operative to move said valve member from said first position to said second position relative to said outlet port thereby to connect a selected one of said first or second bores to said outlet port around the said waist section of said valve member such that said outlet port either applies suction or supplies irrigating fluid from said selected one of said bores, said spring means displacing said valve member upwardly from said second position to said first position when said actuator member is released by the user's finger or thumb such that the other of said bores is connected to said outlet port around the same said waist section of said valve member so that said outlet port then either supplies irrigating fluid or applies suction from said other bore.



4,680,027

NEEDLELESS HYPODERMIC INJECTION DEVICE

James S. Parsons, Laguna Niguel, and Jack S. Gasaway, Irvine, both of Calif., assignors to Injet Medical Products, Inc., Lake Forest, Calif.

Filed Dec. 12, 1985, Ser. No. 808,458
Int. Cl.[4] A61M 5/30
U.S. Cl. 604—68 **25 Claims**

1. An apparatus for injecting liquid medication through the skin of a person without puncturing the skin, while providing for filling of the medication in the conventional manner used to fill syringes for subcutaneous injections comprising:

a disposable syringe comprising:

a cavity for holding a liquid medication;

an aperture in a first end of said syringe through which said liquid medication can flow into and out of said cavity; and

a plunger moveable within said cavity for drawing said liquid medication into said cavity and for forcing said liquid medication out of said cavity;

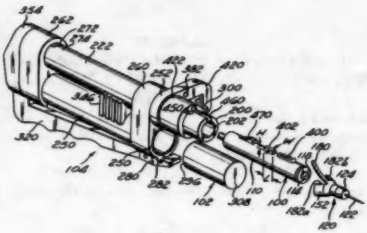
a needle removably attached to said first end of said syringe in substantial alignment with said aperture, said needle insertable into a container of said liquid medication so that a selectively variable volume of liquid medication can be drawn into said cavity through said needle and said aperture, the amount of said liquid being that which is needed by the individual, said needle being removable from said syringe after drawing said liquid medication into said cavity so that said first end of said syringe can be placed in contact with the skin without puncturing the skin; and

a power supply mechanism for receiving and securely holding said syringe and for providing pressure to forcefully move said plunger in said cavity against said liquid medication so that said liquid medication is ejected through said aperture, said power supply mechanism comprising:

a cylinder;

a piston within said cylinder, said piston moveable against said plunger of said syringe to force said liquid medication out of said cavity of said syringe;

a chamber for receiving a sealed container of a compressed gas;



trigger means for unsealing the sealed container to release said compressed gas when force is applied to said trigger means;

means for conducting said released compressed gas to said piston, so that said piston is moved against said plunger to move said plunger against said liquid medication to eject said liquid medication from said cavity through said aperture, said piston and said plunger operable to multiply the pressure provided by said compressed gas to a pressure against said liquid medication sufficient to force said liquid medication through the skin;

first safety means for preventing said syringe from being fully inserted into said power supply mechanism while said needle is attached to said syringe so that the power supply mechanism cannot be used to force out the liquid medication; and

second safety means for preventing said power supply mechanism from releasing said compressed gas until said syringe is fully inserted so that said power supply mechanism cannot be used to eject objects from said power supply mechanism.

4,680,028

FLEXIBLE BREAST RECEPTOR FOR BREAST PUMP

Herbert H. Stuart, Nashville, Tenn., assignor to Lact-Assist, Incorporated, Nashville, Tenn.

Filed Jul. 2, 1984, Ser. No. 626,968
Int. Cl.[4] A61M 1/06
U.S. Cl. 604—74 **9 Claims**

1. In a breast pump for the human breast having means for creating a vacuum, a breast receptor comprising:

(a) a skirt having a single frusto-conical wall of flexible material and a longitudinal axis, and terminating in a large open annular rim for receiving in substantially flush engagement a human breast in a lactating position, and having a small open end portion opposite said large open end, said smaller open end portion being larger than the nipple

of the said human breast so that the nipple extends through said smaller end portion in said lactating position,

(b) the angle of the frusto-conical wall with respect to said longitudinal axis of said skirt being approximately 40–50 deg.,

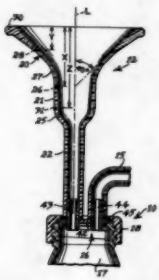
(c) an elongated hollow stem having a tubular wall, a longitudinal axis, and first and second opposite end portions,

(d) the skirt wall of said smaller open end portion merging with the stem wall of said first open end portion to define an axially continuous transition portion means, said first open end portion being large enough to receive the nipple of the breast extending through said transition portion means in said lactating position,

(e) said transition portion means extending from said first open end portion of said hollow stem and flaring toward said annular rim to occupy a substantial portion of said skirt wall, the axial length of said transition portion means being greater than midway between the smaller end portion of said transition portion means and said annular rim,

(f) an elongated receptor tube having a tubular wall of substantially uniform thickness having one end merging with the stem wall of said second end portion, and having an opposite open end adapted to be connected in fluid communication with the means for creating a vacuum,

(g) the thickness of said stem wall decreasing from its second end portion toward its first end portion,



(h) the thickness of said annular rim being great enough to engage and establish a vacuum seal against the corresponding portion of the breast in said lactating position,

(i) the thickness of the wall of said transition portion means being substantially less than the thickness of said annular rim to facilitate collapsing of said transition portion means upon the sides of the nipple and the areola received within and engaging the interior surface of said transition portion means in said lactating position,

(j) said single frusto-conical skirt wall having an outer surface freely exposed to the grasp of a human operator for squeezing and relaxing said transition portion means,

(k) the thickness of said transition portion means being sufficiently reduced to permit the optimum transfer of human touch stimulus by finger squeezing the exterior of said transition portion means and sufficiently flexible to contract and expand in response to the varying air pressures within said receptor against the sides of the nipple and the areola in said lactating position, to cause the release of the Human Prolactin Hormone, and

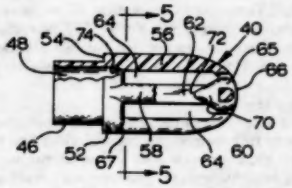
(l) the thickness of the wall of said receptor tube being sufficient to prevent said wall from collapsing when the air pressure within said receptor tube is reduced under normal pumping action by the means for creating a vacuum.

4,680,029

VENA CAVAL CATHETER

Alan B. Ranford, Des Peres, and David C. Fecht, Manchester, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Feb. 23, 1984, Ser. No. 583,068
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **20 Claims**



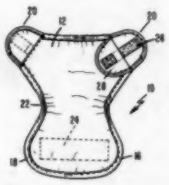
1. A catheter comprising an elongated tube, and a catheter tip including a proximal end portion connected to one end of said tube, a distal end portion having a smoothly contoured outer surface substantially symmetrical about the longitudinal axis of said tip, a plurality of curcumferentially spaced, longitudinally extending struts each connected at one end to said proximal end portion and at the opposite end to said distal end portion, and a generally cone-shaped member connected to the inner side of said distal end portion and tapering radially inwardly in the proximal direction with the apex of said cone-shaped member being substantially coincident with the longitudinal axis of said tip.

4,680,030

GARMENT HAVING IMPROVED, SELF CLOSING, FILAMENTARY FASTENERS

Fredrica V. Coates, 1608 Dublin Rd., Charlottesville, Va. 22903; Richard Jannoni, 16 Whitehall Ave., Edison, N.J. 08820, and Jean Orsini, 813 New York Ave., Raritan, N.J. 08869

Filed Nov. 13, 1985, Ser. No. 797,806
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—391 **20 Claims**



1. A garment, comprising:

a first piece of fabric;

a first fastener means attached to and extending outward from the first piece of fabric, said first fastener means comprising a second piece of fabric having one end attached to the first piece, a first filamentary fastener provided on a portion of said second piece of fabric;

a second fastener means comprising a second, complementary filamentary fastener on a surface of said first piece of fabric and adapted to be coupled to the first fastener means when the first fabric is folded to be worn; and

cover means comprising a third piece of fabric attached only at one end to and extending outward from the first piece of fabric and substantially coextensive with the second piece of fabric, a third, complementary filamentary fastener material provided on a portion of the third piece of

fabric face to face and coextensive with at least a portion of the first filamentary fastener;

the first and third filamentary fasteners thereby tending to self-close to each other during washing.

4,680,031

HEART VALVE PROSTHESIS

Manuel T. Alonso, Newport Beach, Calif., assignor to Tascon Medical Technology Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 445,259, Nov. 29, 1982, which is a continuation-in-part of Ser. No. 303,345, Oct. 7, 1982, abandoned. This application Oct. 24, 1984, Ser. No. 664,150

Int. Cl.[4] A61F *2/24*

U.S. Cl. 623—2 **25 Claims**

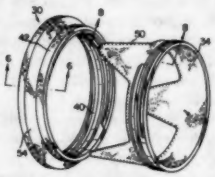
8. In a heart valve prosthesis of the type comprising:

a sewing ring member having a circular first opening therethrough, an exterior wall, and an interior wall surrounding said first opening, said interior wall bearing one or more interior screw threads extending interior to said inner wall and into said first opening;

a valve member having a second opening therethrough, an exterior wall, and an interior wall surrounding said second opening, said exterior wall of said valve member having exterior screw threads extending exterior to said exterior wall and corresponding to said interior screw threads of said sewing ring member such that said valve member may be screwed into said sewing ring; and

a prosthetic heart valve means mounted to said valve member for regulating flow of blood through said second opening through said valve member;

the improvement wherein:



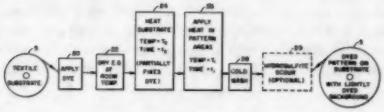
said sewing ring member is fabricated of a biocompatible plastic, and wherein said heart valve includes a first cloth of biocompatible material embedded within said sewing ring member such that said interior screw threads of said sewing ring member are interior to said first cloth and said exterior wall of said sewing ring member is exterior to said first cloth.

4,680,032

PROCESS FOR HEAT TREATING TEXTILE SUBSTRATES TO GIVE A COLORED PATTERN

Robert C. Arnott, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 476,828, Mar. 18, 1983, abandoned.
This application Oct. 24, 1985, Ser. No. 792,619
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—486 12 Claims



1. A method for dyeing the surface of a thermoplastic textile substrate in a desired pattern configuration comprising the steps of:

(a) applying, substantially uniformly, a heat fixable dye material to said substrate surface without fixing said dye;

(b) applying heat substantially uniformly to said substrate surface carrying said dye material, said heat being sufficient to fix a quantity of said dye material substantially uniformly over said substrate surface;

(c) applying heat selectively to said substrate surface in areas defining said desired pattern configuration, said heat being sufficient to increase the fixation level of said dye material in said areas while maintaining said dye material on said substrate surface outside said areas substantially unchanged level of fixation and concentration.

4,680,033

PROCESS FOR PRODUCING WHITE AND COLORED RESISTS ON POLYAMIDE FIBER MATERIALS USING REACTIVE DYE IN FREE VINYL SULPHONE FORM

Bernd Dürl, Kelkheim, Fed. Rep. of Germany; Johannes Bos, Rothrist, Switzerland; Sienling Ong; Peter Raffel, both of Hofheim am Taunus, Fed. Rep. of Germany, and Kurt Brozat, Hünfelden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,209
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1984, 3439532
Int. Cl.[4] D06P *3/24, 5/12*
U.S. Cl. 8—449 13 Claims

1. In a process for preventing fixation of a vinyl sulfone-type fiber-reactive dyestuff at selected places on a sheetlike textile material, wherein the textile material is first printed in the desired pattern with a white or colored resist paste containing a resist agent for said dyestuff and this pattern is then overprinted, over-padded or over-slop padded with an aqueous paste or dyeing liquor containing the resistable reactive dyestuff, whereby the resist agent deactivates the fiber-reactive moiety of the resistable reactive dyestuff in accordance with the said pattern, and wherein the textile material is subsequently heated in order to fix the resisted pattern and the dyeing with the resistable dyestuff wherever it is still fiber-reactive, the improvement which comprises:

treating a polyamide fiber-containing material as the textile material, and

selecting as said resistable reactive dyestuff a dyestuff of the vinyl-sulfone type whose fiber-reactive moiety is either:

(a) present from the outset in the free vinylsulfonyl form, or is

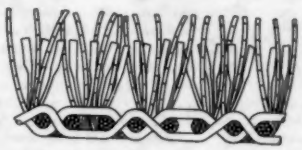
(b) a precursor of this vinylsulfonyl form derived from esters of mono- or polyvalent, inorganic or organic acids with β-hydroxyethylsulfonyl compounds, which has been converted into the free vinylsulfonyl form, before preparation and application of the said aqueous paste or dyeing liquor to the textile material, by treating with alkaline agents.

4,680,034

HIGH CONTRAST PATTERNING PROCESS AND PRODUCT FOR DISPERSE DYED POLYESTER

Robert C. Arnott, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 479,410, Mar. 28, 1983, abandoned.
This application Apr. 10, 1985, Ser. No. 721,502
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—481 14 Claims



1. A method for patterning the surface of a textile substrate comprising polyester yarns containing a disperse dye by treating said surface in pattern-wise configuration comprising the steps of:

(a) selectively applying a heat treatment to pattern areas on said surface of said substrate to enhance the extractability of said dye from at least some polyester yarns within said pattern areas by solvent extraction, while maintaining said surface in pattern-complementary areas in an untreated condition;

(b) exposing said surface to a solvent which selectively extracts a visually significant quantity of said dye contained in said some polyester yarns in said treated pattern areas before said solvent extracts a visually significant quantity of dye from said untreated pattern-complementary areas, said solvent being selected from the group consisting of methylene chloride, acetone, 1,1,1-trichloroethane, perchloroethylene, and ethanol; and

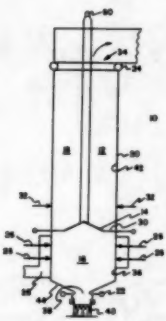
(c) halting said solvent extraction after the desired degree of dye extraction in said pattern and pattern-complementary areas has occurred.

4,680,035

TWO STAGE SLAGGING GASIFIER

Michael C. Tanca, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 27, 1986, Ser. No. 845,164
Int. Cl.[4] C10J *3/48*
U.S. Cl. 48—77 3 Claims



1. In a two stage coal gasifier having an elongated gasifier chamber through which gas is made to flow, said elongated

gasifier chamber being defined by a plurality of elongated members interconnected so as to extend in parallel relation one to another, said elongated gasifier chamber having an opening formed adjacent one end thereof through which the gas after flowing through said elongated gasifier chamber exits from the two stage coal gasifier and having a centrally located slag tap opening formed at the other end thereof through which the slag formed in the two stage coal gasifier exits therefrom, combustor fuel injection means located at a first elevation within said elongated gasifier chamber operative for injecting carbonaceous material therewithin, reductor fuel injection means located at a second elevation within said elongated gasifier chamber operative for injecting carbonaceous material therewithin, the improvement comprising baffle means mounted within said elongated gasifier chamber at a third elevation located between said combustor fuel injection means and said reductor fuel injection means, said baffle means being operative to divide said elongated gasifier chamber into a combustor section and a reductor section, said combustor section extending between said baffle means and said centrally located slag tap opening, said reductor section extending between said baffle means and said opening through which gas exits from the two stage coal gasifier, said baffle means being operative to block off greater than fifty percent of the plan area of said elongated gasifier chamber so as to thereby block radiation from occurring from said combustor section to said reductor section as well as to thereby minimize the possibility of the gas in said reductor section backmixing with the gas in said combustor section, said baffle means having a plan area substantially larger than the plan area of said centrally located slag tap opening so as to thereby cause the slag dropping past said baffle means to fall at a location remote from the location of said centrally located slag tap opening, said baffle means including a plurality of water cooled tubes arranged so as to embody the shape of an inverted Vee with the point of the Vee projecting towards said reductor section, said plurality of water cooled tubes having refractory material secured thereto on the outer surfaces thereof, said baffle means further including first means connected in fluid flow relation to said plurality of water cooled tubes for conveying water thereto and second means connected in fluid flow relation to said plurality of water cooled tubes for conveying water therefrom.

4,680,036

METHOD OF AUTOMATICALLY CONTROLLING AN ELECTROSTATIC PRECIPITATOR

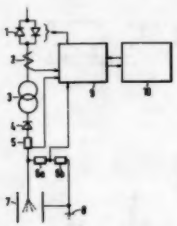
Wilhelm Leussler, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,368

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526754

Int. Cl.[4] B03C *3/68*

U.S. Cl. 55—2 **6 Claims**



1. A method of operating an electrostatic precipitator to obtain a pure gas having a predetermined dust content with a minimum energy consumption, wherein the voltage applied is automatically controlled by semipulses, comprising:

(a) recording for a given electrostatic precipitator typical current-voltage characteristics (I = f (V,ohm) for an operation with an unpulsed voltage (k = 1) and different dust resistivities;

(b) determining for each characteristic the lowest k value with which a pure gas having the predetermined dust content is obtained;

(c) associating the thus determined lowest k value with each characteristic, and continuously automatically controlling the electrostatic: precipitator in consideration of said characteristic in such a manner that

(d) the actual characteristic for the operation with an unpulsed voltage is compared with the recorded characteristics and that k value is selected which corresponds to the recorded characteristic which coincides with the actual characteristic or is next below the actual characteristic.

4,680,037

LACUNAR COBALT COMPLEXES FOR OXYGEN SEPARATION

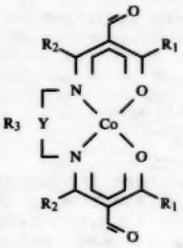
Dorai Ramprasad, Allentown, Pa., and Daryle H. Busch, Columbus, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 28, 1986, Ser. No. 900,935

Int. Cl.[4] B01D *53/22*

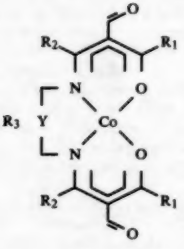
U.S. Cl. 55—16 **26 Claims**

1. A cobalt complex having the structural formula:



wherein each R_1 is independently hydrogen, a phenyl or a C_1–C_6 alkyl group; each R_2 is independently hydrogen or a C_1–C_6 alkyl group; R_3 is a C_4–C_{30} hydrocarbyl radical connecting the two carbonyl carbons; and Y is o-phenylene, $—(CH_2)_a$ wherein "a" is 2 or 3, $—(CH_2)_bNR_4—(CH_2)_c$, wherein "b" and "c" are independently 1, 2 or 3 and R_4 is hydrogen or a C_1–C_{12} alkyl group.

15. A method for separating oxygen from a gaseous mixture comprising oxygen and at least one other component, said method comprising: bringing said gaseous mixture into contact with a cobalt complex having the structural formula:



wherein each R_1 is independently hydrogen, a phenyl or a C_1–C_6 alkyl group; each R_2 is independently hydrogen or a C_1–C_6 alkyl group; R_3 is a C_4–C_{30} hydrocarbyl radical connecting the two carbonyl carbons; and Y is o-phenylene,

$-CH_2)_a$ wherein "a" is 2 or 3, $-CH_2)_bNR_4-CH_2)_c$ wherein "b" and "c" are independently 1, 2 or 3 and R_4 is hydrogen or a C_1–C_{12} alkyl group, such that at least a portion of the oxygen present in the gaseous mixture is reversibly bound to said cobalt complex.

4,680,038

CYCLONE FILTER WITH ALL METAL FILTERING CANDLE

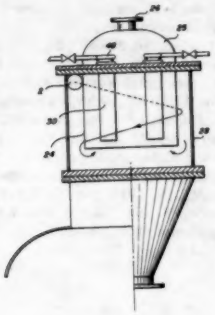
Frank Titus, Am Katzenpfed 4, D-6148 Heppenheim, Fed. Rep. of Germany

Filed Jun. 18, 1985, Ser. No. 746,228

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1984, 3422592

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—302 **2 Claims**



1. A filtering apparatus for separation of solids from a solid carrying fluid comprising:

a housing connected to means for admitting a fluid flow;

an upper collector chamber for cleansed fluid defined by an intermediate separating wall of said housing, said upper collector chamber exhibiting an outlet;

at least one candle filter mounted within said housing comprising two concentrically arranged, metal fabric filter cylinders;

an annular space between said filter cylinders;

means for closing said annular space at a lower extension of said filter cylinders;

an annular duct connected at an upper extension of said filter cylinders, leading through said intermediate separating wall and providing open communication between said annular space and said upper collector chamber;

a plurality of cleaning nozzle means for producing an injection reverse flushing effect to remove solids adhering to said filter cylinders, disposed above and directed into said annular duct; and

a plurality of wash nozzle means, disposed in an area enclosed by said candle filter and externally to said candle filters, for effecting a superficial cleaning of said filter cylinders in case of a product change in order to prevent contamination, without a need of dismantling or replacing said candle filter.

4,680,039

SELF-CONTAINED DUST COLLECTOR WITH QUICK RELEASE ADAPTER DUCT

Alan E. Revell, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 19, 1986, Ser. No. 864,420

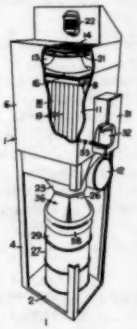
Int. Cl.[4] B01D *46/48*

U.S. Cl. 55—341 R **11 Claims**

1. In a self-contained dust collector comprising a support frame; a housing mounted on said frame having partition means therein dividing said housing into a dirty air chamber having a dirty air inlet and a clean air chamber having a clean air outlet, said partition means having an aperture therethrough connecting said dirty air chamber in air flow communication with said clean air chamber; a filter means operatively mounted across said aperture; means for circulating dirty air through said dirty air inlet, into said dirty air chamber, through said filter means into said clean air chamber and out said clean air outlet; a hopper mounted on said frame in dust receiving relation to said filter means and having a first opening constituting a dust discharge port; and a dust storage receptacle spaced from said dust discharge port and having wall means defining a second opening constituting a dust receiving port, the improvement comprising a quick release adapter duct movable to either an open nonduct forming position or a closed duct forming position relative to said storage receptacle, said adapter duct including:

a semiflexible unitary planar member having an outer periphery and an inner central opening swingably mounted in sealed relation around said dust discharge port;

a plurality of foldable pleats in said planar member, each of said foldable pleats defined by angularly spaced fold axes on said planar member, each of said fold axes having an outer and an inner end, all of said inner ends of said fold axes for each of said pleats intersecting to form an acute angle having a vertex which is located adjacent said inner central opening, all of said outer ends of said fold axes for



each of said pleats terminating at spaced points on said outer periphery;

said foldable pleats being movable between an open attitude lengthening said outer periphery to cause said planar member to assume said open nonduct forming position and to a closed attitude shortening said outer periphery to cause said planar member to assume said closed duct forming position in which said outer periphery of said planar member is in contact with said receptacle wall means in surrounding relation to said dust receiving port; and

resilient means urging said pleats into said closed attitude to maintain said outer periphery of said planar member in sealed contact with said receptacle wall means when said adapter duct is in said closed duct forming position.

9. A quick release adapter duct movable to either an open nonduct forming position or a closed duct forming position and adapted for installation between spaced apart first and second openings, said quick release adapter duct comprising a unitary semiflexible member having an inner central opening and an outer periphery and a plurality of foldable pleats in said planar member, each of said foldable pleats including at least two angularly spaced fold axes, each fold axis having inner and outer ends with said inner ends of said fold axes of each pleat interconnecting to form an acute angle the vertex of which is located adjacent said inner central opening, and said outer ends of said fold axes of each pleat terminating at spaced apart

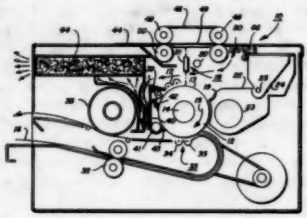
points on said outer periphery, said points spaced from each other along said outer periphery a distance sufficient to allow said outer periphery to expand in length as said pleats are opened along said fold axes to permit said planar member to be moved from said closed duct forming position into said open nonduct forming position.

4,680,040

MULTIPURPOSE FILTERING MATERIAL

Arthur M. Gooray, Penfield; George J. Heeks; Louis Reale, both of Rochester, and Dipika R. Shah, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1986, Ser. No. 820,499
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—387 **28 Claims**



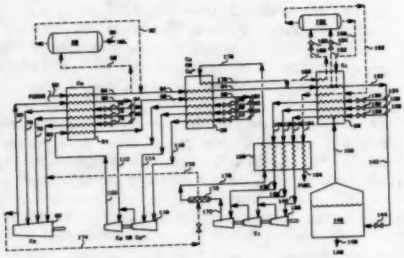
1. A multipurpose filtering material comprising a foraminous support matrix having a plurality of interconnecting voids to permit low impedance to the flow of gaseous material therethrough but sufficient to trap particulate material entrained in the gaseous material, the surface of said support matrix being substantially coated with a thin dehydrated alkaline film of an alkali metal silicate to neutralize nitrogen oxide species in the gaseous material, and having ahesively bound thereto a particulate neutralizer for another noxious gas, the surface of said particulate neutralizer being substantially exposed to the flow of gaseous material.

4,680,041

METHOD FOR COOLING NORMALLY GASEOUS MATERIAL

Bradley W. DeLong, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1985, Ser. No. 814,455
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—11 **19 Claims**



1. In a method for cooling a normally-gaseous feed stream, having a pressure significantly above ambient pressure, comprising:

(a) passing said feed stream through an indirect heat exchange means;

(b) passing a normally-gaseous refrigerant, having a pressure substantially above ambient pressure, through said heat exchange means, as a first stream, in a concurrent direction with said feed stream;

(c) dividing said first stream of refrigerant into at least two second streams of refrigerant, as it exits said heat exchange means;

(d) reducing the pressure of each of said second streams of refrigerant to different, lower pressures; and

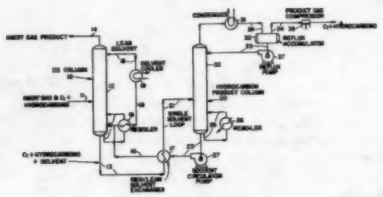
(e) separately passing said second streams of refrigerant, which have thus been reduced in pressure, through said heat exchange means in indirect heat exchange with said feed stream and said first stream of refrigerant and in a countercurrent direction thereto.

4,680,042

EXTRACTIVE STRIPPING OF INERT-RICH HYDROCARBON GASES WITH A PREFERENTIAL PHYSICAL SOLVENT

Yuv R. Mehra, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 808,463, Dec. 13, 1985, which is a continuation-in-part of Ser. No. 784,566, Oct. 4, 1985, Pat. No. 4,617,038, which is a continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, Pat. No. 4,623,371, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, Pat. No. 4,601,738, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Feb. 13, 1986, Ser. No. 828,988
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 **37 Claims**



1. In a process for treating a natural gas stream containing methane, heavier hydrocarbons, and an inert gas,

an improvement comprising selectively extracting natural gas liquids from said natural gas stream with a preferential physical solvent which provides selective capability for recovery according to said selected degree of: (a) ethane in amounts ranging from 2–98%, (b) propane in amounts ranging from 2–99%, (c) butanes in amounts ranging from 2–100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100%, said improvement comprising the following steps:

A. selecting said preferential physical solvent which is selective for ethane and heavier hydrocarbon components of said gas stream such that:

(1) relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in said solvent, is at leas 0.25 standard cubic feet of ethane per gallon of said solvent, or

(2) the preferential factor, determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, is at least 1.25;

B. selectively extracting and stripping said natural gas stream with said physical solvent to produce an inert gas stream and a rich solvent stream containing methane and said hydrocarbons heavier than methane; and

C. distilling said rich solvent stream to produce a stream

of said methane and said selected hydrocarbons heavier than methane and a stream of said physical solvent.

4,680,043

METHOD FOR DENSIFICATION OF POWDERY SILICA AND ARTICLE FORMED THEREBY

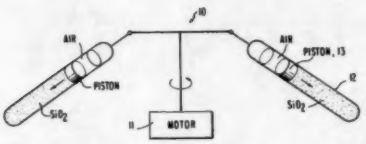
Herbert Ginter, Mobile, Ala.; Reinhard Klingel, Wasserlos, and Reinhard Manner, Maintal, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,811

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429051

Int. Cl.⁴ C03B *37/027*

U.S. Cl. 65—2 **4 Claims**



1. Method for the densification of a powdery substance comprising in a first step introducing a powdery substance consisting of pyrogenically prepared silicon dioxide into a centrifuge having an open receptacle and subjecting said powdery substance to centrifugal action in said open receptacle to bring about a predensification of said substance, and subsequently subjecting the powdery substance to additional centrifugal force in the presence of a free flying piston whereby as a result of the additional centrifugal force, additional pressure is created by the piston on the powdery substance to bring about a further densification of the powdery substance.

4,680,044

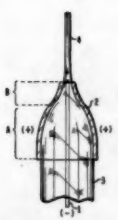
METHOD OF MODIFYING THE REFRACTIVE INDEX OF FLUORIDE GLASS

Ricardo C. Pastor, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 25, 1985, Ser. No. 801,666

Int. Cl.⁴ C03B *37/027*

U.S. Cl. 65—3.11 **9 Claims**



1. A method of modifying the refractive index of a fluoride glass preform having an outer periphery and an inner core comprising:

(a) heating the fluoride glass preform to a temperature that is above its glass transition temperature, but below its devitrification temperatue;

(b) inserting a first electrode into the inner core of the preform and surrounding the outer perimeter of the preform with a second electrode of opposite polarity;

(c) generating an electromotive force using a generating means; and

(d) applying an electromotive force through the first electrode and the second electrode which causes a movement of positive ions toward the electrode of opposite charge while simultaneously causing a movement of negative ions toward its electrode of opposite charge such that the movement of these ions results in a modification of the refractive index of the preform.

4,680,045

METHOD OF PREPARING TUBULAR SILICA GLASS

Haruo Osafune; Sadao Kanbe; Teiichiro Mori, and Masahisa Ikejiri, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,333

Claims priority, application Japan, Oct. 4, 1984, 59-208917; Feb. 13, 1985, 60-26002

Int. Cl.⁴ C03B *37/016*

U.S. Cl. 65—17 **43 Claims**

1. A method of preparing tubular silica glass, comprising the steps of:

preparing a solution of a silicon alkoxide hydrolyzed with an aqueous acid catalyst;

adding ultra-fine particles of silica to the acid hydrolyzed silicon alkoxide solution to form a sol solution;

adjusting the pH of the sol solution to between about 3 to 6;

placing the sol solution into a cylindrical container;

gelling the sol solution by rotating the container to obtain a tubular gel;

drying the tubular gel to a dry gel; and

sintering the dry gel to the tubular silica glass.

4,680,046

METHOD OF PREPARING PREFORMS FOR OPTICAL FIBERS

Nobutaka Matsuo; Masanobu Motoki; Yoshitaka Itoh; Sadao Kanbe, and Haruo Osafune, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,773

Claims priority, application Japan, Oct. 5, 1984, 59-209362; Feb. 12, 1985, 60-25031

Int. Cl.⁴ C03B *37/016*

U.S. Cl. 65—17 **41 Claims**

1. A method of preparing preforms for optical fibers comprising:

preparing a first sol solution of a silicon alkoxide hydrolyzed with an acid and ultrafine particle silica;

placing the first sol solution into a container;

gelling the first sol solution while the container is being rotated at a predetermined rotation rate to obtain a first wet gel having a center hole;

preparing a second sol solution having a different composition than the first sol solution;

filling the center hole of the first wet gel with the second sol solution;

gelling the second sol solution in the first wet gel to obtain a second wet gel;

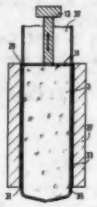
drying the first and second wet gels to form a first and second dry gel composite; and

sintering the first and second dry gel composite to obtain a preform for optical fibers.

4,680,047
METHOD FOR THE MANUFACTURE OF GLASS BODIES

Rolf Clasen, and Heinz Scholz, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1986, Ser. No. 817,320
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511449
Int. Cl.[4] C03B *37/016*
U.S. Cl. 65—17 **17 Claims**



1. A method for the manufacture of a porous green body wherein the green body is subsequently purified and sintered to form a glass body, said method comprising introducing a gelled thixotropic suspension of silicon dioxide particles in a dispersion liquid into a mold, liquefying said gel, while in sail mold, by applying mechanical forces to said gel and removing said mechanical forces from the resultant liquefied suspension therby allowing said liquefied thixotropic suspension to gellify to form said green body.

4,680,048
METHOD OF PREPARING DOPED SILICA GLASS

Masanobu Motoki; Nobutaka Matsuo; Sadao Kanbe; Haruo Osafune, and Yoshitaka Itoh, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,334
Claims priority, application Japan, Oct. 5, 1984, 59-209361
Int. Cl.[4] C03B *37/016*
U.S. Cl. 65—17 **45 Claims**

1. A method of preparing a doped silica glass article, comprising:

hydrolyzing silicon alkoxide;

adding ultrafine particle silica to the hydrolyzed solution to obtain a sol solution;

adjusting the pH of the sol solution to a pre-determined value of less than about 7.0;

placing the sol solution into a container;

gelling the sol solution to a wet gel;

drying the wet gel to a dry gel;

sintering the dry gel to yield the doped silica glass article; and

including at least one dopant.

4,680,049
PROCESS FOR MOLDING OPTICAL COMPONENTS OF SILICATE GLASS TO A NEAR NET SHAPE OPTICAL PRECISION

Paulette I. K. Onorato, Sudbury, and Sophia R. Su, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 15, 1986, Ser. No. 896,780
Int. Cl.[4] C08B *19/06*
U.S. Cl. 65—18.1 **7 Claims**

1. A method for making a near net shape silicate optical glass article comprising the following steps:

Step 1—completely hyrdrolyzing silicon alkoxide in a solvent to form a solution having a molar ratio of silicon alkoxide to water in the range of about 1 to about 10;

Step 2—partially removing from about 20 to about 60 volume percent of the solvent from the resulting solution of step 1 to form a concentrate;

Step 3—transferring the product formed in step 2 into a mold;

Step 4—completely polymerizing the product from step 3;

Step 5—removing the remaining solvent from the product of step 4 to form a solid by supercritically drying said product of step 4;

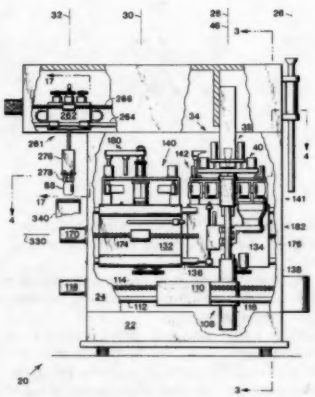
Step 6—removing the solid from step 5 from the mold;

Step 7—sintering the product from step 6 to a density greater than 99% of theoretical obtainable density at a temperature equal to or less than 1150° C. to form a near net shape dense glass article having a near net shape deviation equal to or less than about 12 microns over 3 mm of surface.

4,680,050
GLASSWARE MOLDING MACHINE WITH UNITARY AXIS MOLDING AND METHOD OF MOLDING GLASSWARE

Wilbur O. Doud, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed May 16, 1986, Ser. No. 864,055
Int. Cl.[4] C03B *9/193*
U.S. Cl. 65—79 **22 Claims**



1. An individual section glassware molding machine which comprises:

a neck mold subassembly being guided for vertical movement exclusively along a first vertical axis, and having neck mold portions including neck ring portions that are moveable to opened and closed positions by movement transverse to said first vertical axis;

means, comprising said neck mold portions, a parison plunger, and a parison blank mold, for forming a parison, and for suspending said parison by said neck ring portions;

body forming mold means, comprising body forming mold portions, for cooperating with said neck ring portions in forming an article of glassware from said parison without moving said parison transversely with respect to said first vertical axis;

means for moving said neck mold portions along said first axis and away from said body forming mold portions and said article of glassware; and

means for transporting said body mold portions, with said article of glassware therein, from said first station and said first axis, to a second station.

15. A method for molding an article of glassware, which method comprises:

(a) forming a first parison around a single axis in a first station within a cavity defined by a neck mold having neck ring portions, a parison blank mold, and a parison plunger;

(b) removing said parison plunger and said parison blank mold from said first parison;

(c) suspending said first parison around said single axis by said neck ring portions;

(d) closing a first body forming mold around said single axis and said first parison;

(e) forming a first article of glassware from said first parison around said single axis in said first body forming mold while being suspended by said neck ring portions;

(f) transversely separating said neck ring portions away from said single axis and said first article of glassware;

(g) moving said neck mold with neck ring portions thusly separated along said single axis and away from said first body forming mold and said first article of glassware; and

(h) transporting said first body forming mold with said first article of glassware therein from said first station and said single axis to a second station.

4,680,051

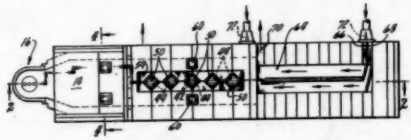
GLASS FOREHEARTH

John F. Blumenfeld, Simsbury, and Frank Bubon, Windsor, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 559,160, Dec. 7, 1983, Pat. No. 4,552,579. This application Nov. 12, 1985, Ser. No. 797,102

Int. Cl.[4] C03B *5/235*

U.S. Cl. 65—346 **9 Claims**



1. A forehearth for the conveyance of molten glass having at least one cooling zone, said cooling zone including a trough, a roof over said trough, head dissipating means asociated with said roof, a pair of spaced projections extending downwardly from the roof to define in the space below the roof a central channel over the central portion of the stream of molten glass and side channels over respective side portions of the stream of glass, and means for applying heat to each side portion of the stream of glass over regions essentially confined within said side channels, wherein the central portion of the stream of molten glass is cooled by radiation within said central channel, conduction through said roof, and dissipation of heat by said heat dissipating means.

4,680,052

HERBICIDAL BENZODISULTAM DERIVATIVE, COMPOSITIONS AND METHOD OF USE THEREFOR

Hans-Joachim Diehr; Christa Fest, both of Wuppertal; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Wolfgang Roy, Langenfeld; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

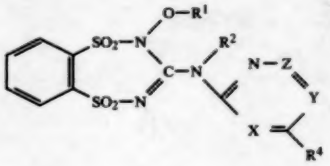
Filed Aug. 23, 1985, Ser. No. 769,191

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431922; May 9, 1985, 3516616

Int. Cl.[4] A01N *43/66, 43/72*; C07D *401/04, 417/04*

U.S. Cl. 71—91 **4 Claims**

1. A benzodisultam of the formula



in which

R^1 represents C_1-C_{12}-alkyl which is optionally substituted by flourine, chlorine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, C_1-C_4-alkylcarbonyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alklyamino-carbonyl or di-(C_1-C_4 -alkyl)-amino-carbonyl; or represents C_3-C_6-alkenyl which is optionally substituted by fluorine, chlorine or bromine; or represents C_3-C_6-alkinyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_2-alkyl or phenyl-C_1-C_2-alkyl which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl; or represents phenyl which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, C_1-C_2-fluoroalkoxy, C_1-C_4-alkylthio, trifluoromethylthio or C_1-C_4-alkoxycarbonyl;

R^2 represents hydrogen; C_1-C_4-alkyl which is optionally substituted by fluorine, chlorine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, C_1-C_4-alkylcarbonyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alkyl-amino-carbonyl or di-(C_1-C_4-alkyl)-aminocarbonyl; or represents C_3-C_6-alkenyl, C_3-C_6-alkinyl or phenyl-C_1-C_2-alkyl which is optionally substituted by flourine, chlorine, nitro, cyano, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl;

R^4 represents hydrogen; fluorine; chlorine; bromine, hydroxyl; C_1-C_4-alkyl which is optionally substituted by fluorine and/or chlorine; C_1-C_4-alkoxy which is optionally substituted by fluorine and/or chlorine; C_1-C_4-alkylthio which is optionally substituted by fluorine and/or chlorine; amino, C_1-C_4-alkylamino or di(C_1-C_4-alkyl)-amino;

X represents nitrogen or a methine bridge (CH),

Y represents nitrogen or an optionally substituted methine bridge C-R^5,

R^5 represents hydrogen, fluorine, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkylcarbonyl or C_1-C_4-alkoxycarbonyl,

Z represents nitrogen or an optionally substituted methine bridge C-R^6,

R^6 represents hydrogen; fluorine; chlorine; bromine; hydroxyl; C_1-C_4-alkyl which is optionally substituted by fluorine and/or chlorine; C_1-C_4-alkoxy which is option-

ally substituted by fluorine and/or chlorine; C_1-C_4-alkylthio which is optionally substituted by fluorine and/or chlorine; amino; C_1-C_4-alkylamino or diC_1-C_4-alkyl)-amino.

3. A herbicidal composition comprising a herbicidally effective amount of a benzodisultam according to claim 1 and a diluent.

4. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a benzodisultam according to claim 1.

4,680,053

HERBICIDAL ALKENYL SULFONAMIDES

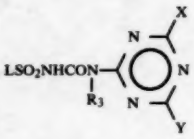
George Levitt, Wilmington, Del., and William T. Zimmerman, Landenberg, Pa., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 383,323, Jun. 2, 1982, Pat. No. 4,461,640, which is a continuation-in-part of Ser. No. 328,115, Dec. 7, 1981, abandoned. This application Jul. 13, 1984, Ser. No. 630,873

Int. Cl.[4] C07D *251/46, 251/52;* **A01N** *43/66, 43/70*

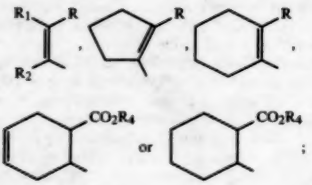
U.S. Cl. 71—93 **19 Claims**

1. A compound of the formula:



where

L is



R is F, Cl, Br, C_1–C_3 alkyl, CO_2R_4, C(O)SR_8, C(O)NR_5R_6 or S(O)$_m$$R_7$;

R_1 is H, F, Cl, Br or C_1–C_3 alkyl;

R_2 is H, F, Cl, Br or C_1–C_3 alkyl;

R_3 is H or CH_3;

R_4 is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;

R_5 is H or C_1–C_3 alkyl;

R_6 is C_1–C_3 alkyl; or

R_5 and R_6 may be taken together to form —$(CH_2)_4$—, —$(CH_2)_5$— or —$(CH_2)_2O(CH_2)_2$—;

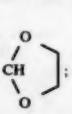
R_7 is C_1–C_3 alkyl;

R_8 is C_1–C_4 alkyl;

m is 0, 1 or 2;

X is CH_3 or OCH_3;

Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, NH_2, $NHCH_3$, $N(CH_3)_2$, $CH(OCH_3)_2$ or



and their agriculturally suitable salts; provided that:

(1) when R is halogen and R_1 and/or R_2 are halogen, then the values of R, R_1 and R_2 must be the same;

(2) when R_1 and R_2 are halogen, then the values of R_1 and R_2 must be the same;

(3) the total number of carbon atoms of R_5 and R_6 is less than or equal to 5;

(4) R_1 and R_2 are not simultaneously H.

12. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

4,680,054

TRIAZINE DERIVATIVES, A PROCESS FOR PREPARING THE DERIVATIVES, AND HERBICIDES CONTAINING THE DERIVATIVES AS THE EFFECTIVE COMPONENT

Tetsuo Takematsu, Utsunomiya; Masahiro Nishii, Ichihara, and Izumi Kobayashi, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

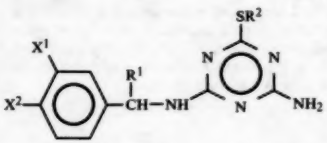
Filed Feb. 4, 1986, Ser. No. 825,817

Claims priority, application Japan, Feb. 15, 1985, 60-26549

Int. Cl.[4] C07D *251/52;* **A01N** *43/70*

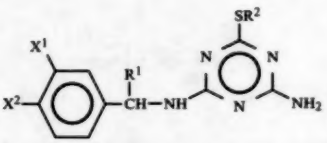
U.S. Cl. 71—93 **11 Claims**

1. A triazine derivative represented by the general formula:



wherein R^1 and R^2 are each an alkyl group having 1 to 4 carbon atoms, and X^1 and X^2 are each a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, or an alkylthio group having 1 to 4 carbon atoms.

3. A herbicide comprising (i) a herbicidal carrier, and (ii) an herbicidaly effective amount of a triazine derivative represented by the general formula:



wherein R^1 and R^2 are each an alkyl group having 1 to 4 carbon atoms, and X^1 and X^2 are each a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, or an alkylthio group having 1 to 4 carbon atoms.

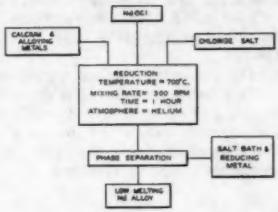
7. A herbicide according to claim 3 wherein said carrier is a solid carrier, and said herbicide is formulated as a wettable powder with said triazine derivative being present in an amount of 10 to 55 parts by weight.

4,680,055

METALLOTHERMIC REDUCTION OF RARE EARTH CHLORIDES

Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1986, Ser. No. 840,762
Int. Cl.[4] C22B 59/00; C01F 11/24
U.S. Cl. 75—84.5 15 Claims


MgOCl
CALCIUM & ALLOYING METALS
CHLORIDE SALT
REDUCTION TEMPERATURE = 700°C. MIXING RATE= 300 RPM TIME = 1 HOUR ATMOSPHERE = HELIUM
PHASE SEPARATION
SALT BATH & REDUCING METAL
LOW MELTING RE ALLOY

1. A metallothermic method of reducing rare earth chloride and/or oxychloride feedstock to rare earth metal comprising forming a molten bath of Group I or Group II element chloride salts in a reaction vessel; forming a molten metal collection pool having a higher specific gravity than the chloride salt in the vessel; adding a volume of rare earth feedstock less than the volume of said chloride salt bath to the vessel; adding a stoichiometric excess of calcium metal based on said rare earth thereto; agitating the constituents in the vessel such that the rare earth feedstock is reduced to rare earth metal; and allowing the reactions constituents to settle into separate layers respectively containing any excess calcium metal, the chloride salt, and the reduced rare earth metal in the molten metal collection pool.

4,680,056

CARBONLESS PAPER SOLVENT UTILIZING TRIISOPROPYLTOLUENE

Andrew P. Komin, Wichita, Kans., assignor to Koch Industries, Inc., Wichita, Kans.

Filed Jan. 23, 1986, Ser. No. 821,983
Int. Cl.[4] C09D 11/00
U.S. Cl. 106—21 10 Claims

1. A solvent for dye used in pressure sensitive copying paper comprising (a) one or more members of the group comprising alkylated napthalenes, diarylmethanes and alkylated biphenyls and (b) triisopropyltoluene.

4,680,057

EASILY FLUSHABLE TRANSPARENT, STRONG DIARYLIDE YELLOW PIGMENT COMPOSITIONS

Byron G. Hays, Verona, N.J., assignor to BASF Corporation, Inmont Division, Clifton, N.J.

Filed Apr. 12, 1985, Ser. No. 722,971
Int. Cl.[4] C09D 11/08
U.S. Cl. 106—23 7 Claims

1. In an aqueous diarylide yellow pigment composition comprising the sulfonated coupling product of:

(A) The tetrazo salt of 3,3'-dichlorobenzidine, optionally in admixture with the tetrazo salt of 2,2'-disulfobenzidine, and

(B) An acetoacetarylide, optionally in admixture with p-sulfo-acetoacetanilide,

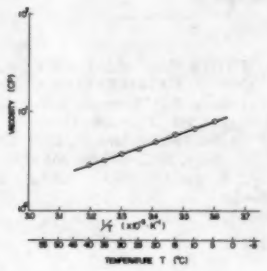
the improvement comprising the inclusion of a quaternary ammonium salt selected from the group consisting of di cotyl di methyl, tri octyl methyl, di decyl di methyl, coco benzyl dimethyl, dicoco dimethyl, di soya dimethyl, di H tallow dimethyl, tallow trimethyl/dicoco dimethyl, octadecyl benzyl dimethyl, dodecyl pyridinium, hexadecyl pyridinium, quaternary ammonium salts and dicoco amine/acetic acid and dicoco methyl amine/acetic acid ammonium salts, thereby producing a sulfonated diarylide yellow pigment composition having easy flushability, high transparency and high color strength.

4,680,058

WHITE INK COMPOSITION FOR INK-JET PRINTING

Ryuichi Shimizu, Hitachiota; Yasuki Mori, Hitachi; Tsuneaki Kawanishi, Hitachi; Osamu Isoo, Hitachi; Hirosada Morishita, Hitachi, and Tooru Hosoda, Koshigaya, all of Japan, assignors to Hitachi, Ltd. and Dainichiseika Color & Chemicals MFG. Co., Ltd., both of, Japan

Continuation of Ser. No. 519,674, Aug. 2, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 711,003
Claims priority, application Japan, Aug. 4, 1982, 57-135166
Int. Cl.[4] C09D 11/08
U.S. Cl. 106—23 33 Claims



1. A white ink composition for ink-jet printing, which consists essentially of 4.5 to 40% by weight of inorganic white pigment having a particle size of less than 3 μm on the basis of the ink composition; a binder resin selected from the group consisting of a rosin-modified maleic acid resin, a xylene resin, a rosin-modified xylene resin, an ester gum, a ketone resin, a nitrocellulose, a novolak phenol resin, a resole phenol resin, a rosin-modified phenol resin, an alkylphenol resin, a terpene-modified phenol resin, a glycerine ester of rosin, a polyethyleneglycol ester of rosin, and a hydrogenated rosin or an ester thereof in an amount of 0.1 to 5 parts by weight per part by weight of the inorganic white pigment; 55 to 90% by weight of a solvent capable of dissolving said binder resin selected from the group consisting of an alcohol, a ketone, an ether, an acetate ester and cyclohexanone on the basis of the ink composition; and 0.25 to 5% by weight of a specific resistance-controlling agent capable of adjusting the specific resistance of the composition to less than 2,000 Ω.cm on the basis of the ink composition, said specific resistance-controlling agent being selected from the group consisting of an alkali metal halide; an ammonium halide; a thiocyanate of an alkali metal, an alkaline earth metal or ammonium; and a nitrate of an alkali metal, an alkaline earth metal or ammonium.

4,680,059

BUILDING MATERIAL

David J. Cook, and Nam W. Lim, both of St. Ives, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Oct. 1, 1984, Ser. No. 656,725
Claims priority, application Australia, Sep. 30, 1983, PG1660
Int. Cl.[4] C04B 7/34
U.S. Cl. 106—120 15 Claims

1. A building material comprising from 20 to 70% of a reactive amorphorous silicate material obtained by combusting a combustible silica containing material which has been reacted with an aqueous solution of an iron salt, from 20 to 60% by weight of a filler containing reactives polyvalent cations, from

10 to 50% by weight of lime and from 0 to 10% by weight of reinforcing fillers.

4,680,060

PROCESS FOR THE EXTRACTION OF CONTAMINANTS FROM PLASTICS

Ashis S. Gupta, Marietta, and Jerald T. Camp, Loganville, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 20, 1985, Ser. No. 778,005
Int. Cl.[4] B08B *30/00*
U.S. Cl. 134—26 **15 Claims**

1. A process for the removal of contaminants from plastic tubing used in syrup lines of a post-mix beverage dispenser, which comprises the steps of:

flushing said tubing with propylene glycol to extract the contaminants; and

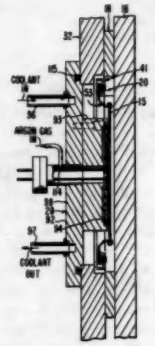
rinsing said tubing with water to remove any remaining propylene glycol.

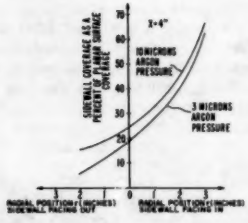
4,680,061

METHOD OF THERMAL TREATMENT OF A WAFER IN AN EVACUATED ENVIRONMENT

Lawrence T. Lamont, Jr., Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 106,343, Dec. 21, 1979. This application Apr. 7, 1982, Ser. No. 366,433
Int. Cl.[4] H01L *21/263*
U.S. Cl. 148—1.5 **19 Claims**




X=4"
10 MICRONS ARGON PRESSURE
3 MICRONS ARGON PRESSURE
SUBSTRATE COVERAGE AS A PERCENT OF PAPER SURFACE
RADIAL POSITION (INCHES) SIDEWALL FACING OUT
RADIAL POSITION (INCHES) SIDEWALL FACING IN

1. The method of treating a wafer-like article in a vacuum chamber comprising the steps of positioning the article over a heat-exchanging structure at a station within the vacuum chamber, pushing the article against said structure and maintaining a gas under pressure which is substantially less than atmospheric pressure between the article and said structure to facilitate the conduction of heat between the article and said structure by said gas, said gas being inhibited from flowing from between said structure and article while said article is being pressed against said structure and said heat conduction by said gas is being facilitated.

4,680,062

METHOD FOR REDUCING CORE LOSSES OF GRAIN-ORIENTED SILICON STEEL USING LIQUID JET SCRIBING

Tien-Hung Shen, and James A. Salsgiver, both of Sarver, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1985, Ser. No. 803,361
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 **8 Claims**

1. A method for improving core loss of grain-oriented silicon steel strip, which has been cold rolled to final gauge, said method comprising scribing the steel after said cold rolling in a direction substantially transverse to the rolling direction by directing a pressurized jet of only liquid onto the steel surface to form selected spaced-apart scribe lines.

4,680,063

METHOD FOR REFINING MICROSTRUCTURES OF TITANIUM INGOT METALLURGY ARTICLES

Russell G. Vogt, Xenia; Daniel Eylon, Dayton, and Francis H. Froes, Xenia, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 13, 1986, Ser. No. 896,035
Int. Cl.[4] C22F *1/18*
U.S. Cl. 148—11.5 F **8 Claims**

1. A process for fabricating forged titanium alloy components which comprises the steps of

(a) forging a titanium alloy billet to a desired shape;

(b) heat treating the shaped component at about 4% below to about 10% above the beta-transus temperature of the alloy for about 5 minutes to 4 hours, followed by rapid cooling;

(c) hydrogenating the component at an elevated temperature to a desired hydrogen level;

(d) cooling the thus-hydrogenated component at a controlled rate to room temperature;

(e) dehydrogenating the thus-cooled, hydrogenated component at an elevated temperature to a desired hydrogen level; and

(f) cooling the thus-dehydrogenated component at a controlled rate to room temperature.

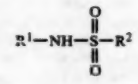
4,680,064

PHOSPHATE CONVERSION COATING ACCELERATORS

Heinz Portz, Roesrath-Kleineichen, and Othmar V. Ettingshausen, Duesseldorf, both of Fed. Rep. of Germany, assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 631,022, Jul. 16, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 781,316
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325974
Int. Cl.[4] C23C *22/12*
U.S. Cl. 148—617 **36 Claims**

1. A phosphating composition for zinc-, iron-, or zinc-iron-phosphate conversion coatings, excluding nitrite as an accelerator, and containing an accelerator which is one of the following compounds, its alkali metal salt or ammonium salt, or any mixture thereof:

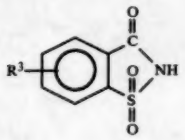

(I)

wherein:

R^1 is

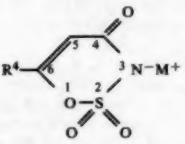
(i) a C_{1-4} linear or branched alkyl radical,
(ii) a C_{5-6} saturated carbocyclic or heterocyclic radical, or
(iii) an aryl or aralkyl radical having at least 6 members; and

R^2 is
(i) hydroxy,
(ii) $-O^-M^+$ in which N^+ is an alkali metal or an ammonium ion, of
(iii) an aromatic ring having at least 6 members, optionally substituted by a hydroxy, amino, (C_{1-3} alkyl-)—CO—NH or (carboxy C_{1-3} alkyl)—CO—NH radical;



(II)

wherein,
R^3 is
(i) hydrogen,
(ii) hydroxy, or
(iii) anamino radical;



(III)

wherein:
R^4 is
(i) hydrogen, or
(ii) a C_{1-4} linear or branched alkyl radical and
M^+ is an alkali metal or an ammonium ion.

4,680,065

BRANCH-OFF TECHNIQUE

Jan Vansant, Louvain; Noel Overbergh, Bertem; Valere Buekers, Zelem-Halen, and Amandus L. E. Pieck, Kortenaken, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 689,622, Jan. 8, 1985, Pat. No. 4,641,009. This application Aug. 25, 1986, Ser. No. 900,037

Claims priority, application United Kingdom, Jan. 10, 1984, 8400508; Sep. 21, 1984, 8424005

Int. Cl.[4] H01B *13/22*

U.S. Cl. 156—49 **24 Claims**

1. A method of forming a branch-off seal between a sleeve and at least two substrates which comprises:
(a) positioning at an end portion of the sleeve means for forming in the sleeve at least two terminal conduits said means for forming including a heating means;
(b) positioning the substrates in respective conduits;
(c) positioning a heat-activatable material within the sleeve at or adjacent the end portion; and
(d) activating the heat-activatable material by the heating means.

23. A kit-of-parts which comprises a sealing member and a sleeve, wherein the sealing member is positionable within an end portion of the sleeve, and which comprises an elongate member having self contained heating means and an outer surface comprising a heat-activatable sealing material in thermal contact with the heating means.

4,680,066

LINING OF PIPELINES OR PASSAGEWAYS

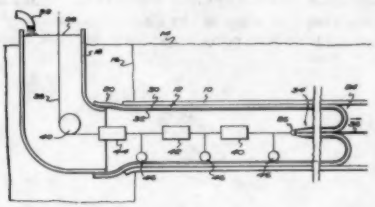
Eric Wood, Northants, England, assignor to Insituform Group Limited, Isle of Man

Filed Jul. 15, 1985, Ser. No. 754,722

Claims priority, application United Kingdom, Jul. 13, 1984, 8418038

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—156 **10 Claims**



1. In the method of lining a pipeline or passageway with a flexible tubular liner that includes introducing into said pipeline or passageway a liner comprising an inner tube of resin absorbent material and an outer membrane impervious to fluids, everting said liner during its travel through said pipeline or passageway so that when everted said tube of resin absorbent material is pressed outwardly against the inner surface of said pipeline or passagewy and said impervious membrane is disposed inwardly of said everted tube of resin absorbent material, said resin absorbent material being saturated with a light curable resin prior to or after its eversion, and introducing light curing means into the interior of said everted liner to thereby cure said light curable resins, the improvement which comprises controlling the movement of said light curing means through said everted liner by attaching said light curing means to the trailing end of the liner that will be the last to be everted.

4,680,067

METHOD AND ARRANGEMENT FOR ATTACHING PRINTING PLATES TO A PLATE CYLINDER

John Moore, La Conversion, Switzerland, assignor to De la Rue Giori S.A., Lausanne, Switzerland

Filed Jun. 4, 1986, Ser. No. 870,441

Claims priority, application Switzerland, Jul. 26, 1985, 3258/85

Int. Cl.[4] B32B *31/12, 31/20*; B41F *13/08*

U.S. Cl. 156—165 **8 Claims**

1. Method of attaching printing plates to a plate cylinder of a web fed intaglio printing machine, said plate cylinder comprising a cylindrical barrel of ductile material, having a slightly tapered inner wall, comprising the following steps:
(a) at least two intaglio printing plates having a total length equal to the circumference of the cylindrical barrel are prepared and bent;
(b) the cylindrical barrel is expanded radially within the

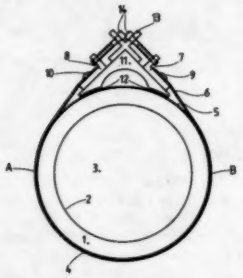
limits of elastic deformation by using mechanical means so that the outer diameter of the cylindrical barrel after fixing the plates is equal to the diameter it should have in the printing machine;

(c) a layer of adhesive substance is applied to one portion of the cylindrical barrel which corresponds to the dimensions of said printing plate, but of which layer the length in the peripheral direction is greater than the length of said printing plate;

(d) one of the printing plates is placed on the cylindrical barrel coated with the adhesive substance, while positioning and holding said one plate in the precise position it should have on the cylindrical barrel;

(e) on the cylindrical barrel and next to the two edges of the printing plate which are parallel to the axis of the cylindrical barrel, there is disposed at least one sheet having the same thickness and width as the printing plate, and a hardness about the same as that of said plate, and of the same length as the peripheral length of the noncovered surface of the cylindrical barrel for preserving the continuity of the cylindrical barrel surface beyond the portion covered with the printing plate;

(f) a tightening ribbon is disposed around the printing plate so as to cover this plate completely, the length of said ribbon being greater than that of said plate, so that it will also cover the sheet or sheets at least in the vicinity of the two transverse edges of the plate, the areas of the two ends of the ribbon being tangential to the plate cylinder;



(g) after softening the adhesive substance tractive forces are exerted at spaced intervals along the two ends of the ribbon in directions orthogonal to the cylindrical barrel axis, by beginning from points located at the centers of the respective ends of the ribbon and advancing symmetrically towards the lateral peripheral edges of the ribbon, so that the excess of adhesive substance will be forced towards said lateral peripheral edges of said cylindrical barrel;

(h) when the adhesive substance has set, the ribbon and the sheet or sheets is or are removed, then a layer of adhesive substance is applied to another portion of the cylindrical barrel which corresponds to the dimensions of the second printing plate, this second printing plate is applied thereto one or more sheets are disposed as before in the portion of the cylinder surface not covered by the plates, the second printing plate is covered with the ribbon like the first printing plate, and tractive forces are exerted as in the preceding step until the adhesive substance has set, whereafter the ribbon is removed;

(i) step (h) is repeated until the entire cylindrical surface of the plate cylinder is covered;

(j) grooves between the adjacent plates are filled up and the areas of these filled grooves are machined to provide an unbroken peripheral surface; and

(k) the application of forces causing the expansion of the cylindrical barrel is discontinued.

4,680,068

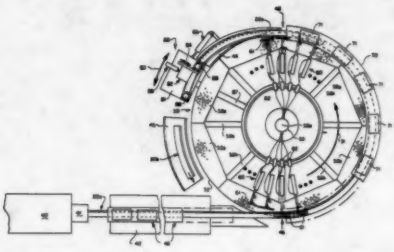
METHOD FOR FORMING DRUM HANDLING RINGS

Donald R. Hofstetter, 11090 Clay St., Montville, Ohio 44064, and Louis F. Fow, Jr., 30 Greentree Rd., Chagrin Falls, Ohio 44022

Division of Ser. No. 638,285, Aug. 6, 1984, Pat. No. 4,626,186. This application Jul. 7, 1986, Ser. No. 882,473

Int. Cl.[4] B29C *47/78*

U.S. Cl. 156—196 **9 Claims**



1. A method of forming a ring from a strip of plastic material comprising the steps of:

providing said strip in a non-solidified condition, said strip being curved to a predetermined degree out of a secondary plane B—B generally perpendicular to a primary plane A—A;

solidifying said curved strip to a predetermined degree wherein it will maintain its curved condition; and

bending said solidified, curved strip out of said primary plane A—A to form a ring having a geometry dependent on the degree of curvature of said strip out of said secondary plane B—B.

4,680,069

METHOD FOR THE FABRICATION OF A DOUBLE-WALLED CONSTRUCTION ELEMENT

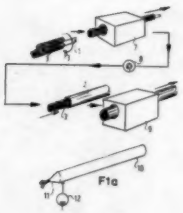
Johan J. M. E. Weyts, Bisschopsdreef 13, 8310 Brugge (Sint-Kruis), Belgium

Filed Feb. 17, 1984, Ser. No. 581,040

Claims priority, application Netherlands, Feb. 25, 1983, 8300719

Int. Cl.[4] B31D *3/02;* **B32B** *31/04, 31/22*

U.S. Cl. 156—197 **17 Claims**



1. The method of making a honeycomb-reinforced structure which comprises the steps of:

(a) providing a stack of intermittently joined elongate strips which will form a honeycomb structure when expanded in the direction perpendicular to the strips and machining said stack to present opposite side faces, defined by the cumulative opposite side edges of the strips, which are in predetermined relationship to each other and with the stack presenting a lengthwise dimension commensurate

with the lengths of the strips and a widthwise dimension commensurate with the cumulative thickness of the strips;

(b) expanding said stack in the direction perpendicular to said strips to form a honeycomb structure whose widthwise dimension has been increased from said widthwise dimension of the stack to a first predetermined value while the lengthwise dimension of the honeycomb structure has decreased from said lengthwise dimension of the stack to a second predetermined value and honeycomb cells extend between said opposite side faces;

(c) wrapping and affixing the expanded stack in its widthwise direction around a hollow tubular member having an outer surface whose circumference is equal to said first predetermined value of the widthwise dimension of the honeycomb structure so that said one opposite side face of the honeycomb structure contacts said outer surface and completely encompasses the hollow tubular member to deform the other opposite side face of the honeycomb structure into a predetermined shape; and

(d) fitting the structure of step (c) lengthwise into an outer hollow tubular member having an inner surface conforming to said predetermined shape of said other opposite side face of the structure of step (c) and joining said other opposite side face to said inner surface to form the honeycomb-reinforced structure.

4,680,070

TUBES OF MICROPOROUS THERMAL INSULATION MATERIAL

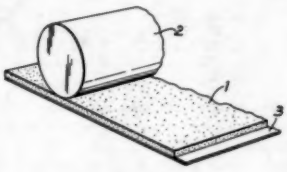
John T. Hughes, Worcester, United Kingdom, assignor to Micropore International Limited, Droitwich, United Kingdom

Filed Jun. 6, 1985, Ser. No. 742,050

Claims priority, application United Kingdom, Jun. 7, 1984, 8414526

Int. Cl.[4] B29C *1/00*

U.S. Cl. 156—218 **10 Claims**



1. A method of manufacturing a tube of microporous thermal insulation material, which method comprises the steps of:

forming a substantially flat slab of microporous thermal insulation material;

said microporous thermal insulation material formed by compacting a finely divided powder selected from the group consisting of pyrogenic silica, carbon black, and finely divided metal oxides, said microporous thermal insulation material being relatively friable;

providing on one surface of the slab a membrane which is to form an outer skin of the tube to be produced;

wrapping the slab and the membrane around a mandrel having a diameter corresponding to the internal diameter of the tube to be produced such that the ends of the slab abut substantially against each other;

securing the longitudinally extending edges of the membrane relative to each other so as to form a tube; and

removing the tube from the mandrel.

4,680,071

METHOD FOR MAKING RUBBER ARTICLES

Richard D. Candle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 27, 1984, Ser. No. 635,377

Int. Cl.[4] B29C *53/36*

U.S. Cl. 156—218 **22 Claims**

1. A method for manufacturing an indefinite length thermosetting tubular article comprising the steps of:

(a) plying up a plurality of thermosetting elastomeric layers to form an uncured thermosetting web having a central portion and lateral edge portions;

(b) curing said central portion of the width of the uncured thermosetting web in compressive engagement with a means for curing for a time sufficient to form a center cured web having a cured central portion, and a first uncured lateral edge portion and a second uncured lateral edge portion;

(c) overlapping said first uncured lateral edge and second uncured lateral edge portions to form a longitudinal overlap splice; and

(d) curing the longitudinal overlap splice in compressive engagement with a means for curing for a time sufficient to fully cure the longitudinal splice to form a fully cured tubular web.

4,680,072

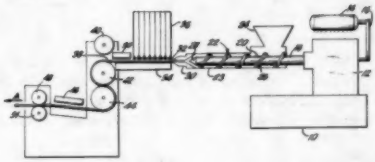
METHOD AND APPARATUS FOR PRODUCING MULTILAYERED PLASTIC CONTAINING SHEETS

John J. Farrell, Greenbrook, N.J., assignor to Wedco Inc., Bloomsbury, N.J.

Filed Apr. 30, 1985, Ser. No. 728,711

Int. Cl.[4] B29C *47/06*

U.S. Cl. 156—243 **18 Claims**



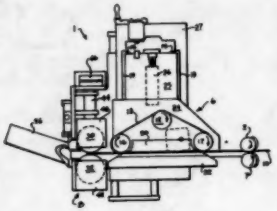
1. A process for the production of a multilayer plastic sheet comprising sequentially disposing at least two powdered flowable materials onto a melted layer of plastic by means of dropping said materials by gravity flow from a storage vessel onto said plastic, said plastic being conveyed in a given direction, each material corresponding to a separate layer of the resulting multilayer sheet.

4,680,073

METHOD AND APPARATUS FOR HEAT SEALING

Hans A. Brunner, and Donald E. Vaughan, both of Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 17, 1986, Ser. No. 839,938
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—250 7 Claims



1. A method for forming a fin seal along an edge of a plastics resin film comprising passing an end of said film between a pair of guide rollers, passing said end between a heated, driven band sealing surface and a backup surface to form a sealed region within said end, and subsequently driving said end and cutting excess material from said end, including a portion of said sealed region, to thereby form said edge by passing said end between a rotating drive wheel having a cutting knife therein and a rotating backup wheel, said drive wheel and said backup wheel being sufficiently close to said band such that said end remains in registry during sealing and cutting and said sealed region is cut while at an elevated temperature.

4,680,074

METHOD FOR PRODUCING A CARRIER MATERIAL FOR THE SOLAR CELLS OF A SOLAR GENERATOR

Walter Schmitz, Wedel, and Jürgen Koch, Holm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,813
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418078
Int. Cl.[4] H01L *31/02*
U.S. Cl. 156—291 18 Claims

1. A method for producing a carrier material for use in a solar generator composed of a plurality of solar cells electrically conductively connected together, the solar cells being fastened only on one side thereof to the carrier material, said method comprising:

providing a glass fiber fabric composed of intersecting glass fibers;

applying liquid plastic composed of a plastic dissolved in a solvent to only the points of intersection of the glass fibers;

evaporating the solvent; and

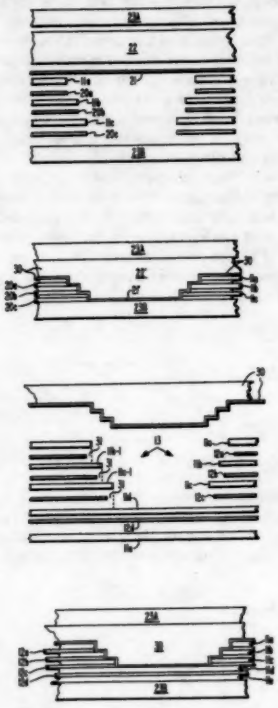
hardening the plastic so that the glass fibers are firmly mechanically connected together by the hardened plastic at the points of intersection.

4,680,075

THERMOPLASTIC PLUG METHOD OF FABRICATING AN INTEGRATED CIRCUIT PACKAGE HAVING BONDING PADS IN A STEPPED CAVITY

Norman E. McNeal, Carlsbad, and Richard A. Nagy, Leucadia, both of Calif., assignors to UNISYS Corporation, Detroit, Mich.

Filed Jan. 21, 1986, Ser. No. 819,996
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—289 13 Claims



1. A method of fabricating an integrated circuit package prior to the placement of a circuit chip therein, said method including the steps of:

assembling a stack which is comprised of a plurality of superposed thin flat epozy-glass layers, adhesive layers between said epoxy-glass layers, a staircase-shaped cavity which extends from an outer epoxy-glass layer of said stack to an internal epoxy-glass layer of said stack and goes parallel along a portion of the flat upper surface of said internal epoxy-glass layer and then penetrates through it, and conductors on said internal epoxy-glass layer including bonding pads on said flat upper surface portion;

inserting into said cavity a thermoplastic plug which is coated with a film of a release material that resists sticking to said epoxy-glass and said adhesive, and which differs from the shape of said cavity by predetermined tolerances and extends over a larger area outside the cavity;

laminating said stack, while said plug is in said cavity, at a temperature and pressure which causes said plug to soften and conform to the exact shape of said cavity, without sticking in said cavity, and thereby dam said adhesive from flowing onto said bonding pads on said flat upper surface portion; and

removing said thermoplastic plug from said cavity subsequent to said laminating step.

4,680,076

MULTIPHASE EPOXY THERMOSETS HAVING RUBBER WITHIN DISPERSE PHASE

John K. Bard, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 28, 1986, Ser. No. 901,097
Int. Cl.[4] C09J 5/10; C08K 3/04; C08F 283/10
U.S. Cl. 156—306.9 15 Claims

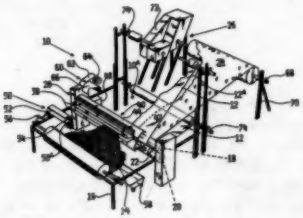
1. A thermoset comprising a crosslinked epoxy resin matrix with a fracture toughness, K_{IC}, of at least 1.2 MPa$\sqrt{m}$, at least one Tg of at least about 150° C. and comprising a glassy discontinuous phase which contains a rubber phase and is dispersed in a glassy continuous phase that continues throughout said resin matrix, said discontinuous phase constituting at least about 25 volume % of the total volume of said phases.

4,680,077

LAMINATING METHODS AND APPARATUS USING RESILIENT FACED ROLLERS

Thomas C. Hodgson, Auckland, New Zealand, assignor to Strong Plastics Limited, New Zealand

Filed Jun. 20, 1985, Ser. No. 747,140
Claims priority, application New Zealand, Jun. 25, 1984, 208644
Int. Cl.[4] C09J 5/06
U.S. Cl. 156—321 13 Claims



1. An apparatus for laminating a plastics film to a second element comprising a pair of nip gap forming rollers with the peripheral surfaces thereof being covered with natural wool fabricated into a mat form having projecting tufts of fibres, means to feed a plastics film through the nip gap as to be in contact with the natural wool covered surfaces of said rollers, heating means to heat the plastics film whereby at least a first surface thereof distal of the natural wool covered surfaces of said rollers is substantially at a fusion temperature as the film enters the nip gap, means to feed an element through the nip gap whereby a treated surface thereof makes contact with the fused surface of the plastics film and applicator means to dispense an adhesive containing a wetting agent onto the element to thus form the treated surface thereof.

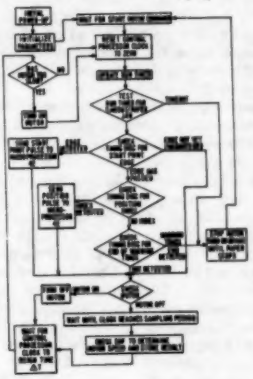
6. A method of laminating a plastics film to a metal network structure comprising the steps of heating a first surface of the film to substantially a fusion temperature therefor, applying an adhesive containing a wetting agent to a surface of said metal network structure, introducing the plastics film and said metal network structure together with the adhesive covered surface of said metal network structure adjacent to the first surface of the plastics film, with in so doing, passing them between a pair of rollers arranged to form a nip gap therebetween, the peripheral surface of at least the roller corresponding to the plastics film being covered with resilient material.

4,680,078

HAND-HELD LABELER HAVING IMPROVED WEB POSITION SENSING AND PRINT HEAD CONTROL

James L. Vanderpool, Kettering, and James M. Bain, Xenia, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 596,346, Apr. 3, 1984, Pat. No. 4,584,047.
This application Oct. 28, 1985, Ser. No. 791,702
Int. Cl.[4] B65C 9/18, 11/02
U.S. Cl. 156—352 5 Claims



1. A hand-held labeling machine comprising:

a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releasably adhered to a backing strip, means for printing on a label at a printing position, means for peeling the printed label from the backing strip, label applying means disposed adjacent the peeling means, means for advancing the web to peel a printed label from the backing strip at the peeling means and advance the printed label into a label applying relationship with the label applying means and to advance another label into the printing position, a motor for driving said advancing means, means for entering selected data to be printed, the printing means including a thermographic print head having a plurality of individually selectable print elements for printing on a thermographic label at a printing positon, means coupled to said data entering means for electrically processing the selected data and energizing the individual print elements in a predetermined sequence determined by the selected data to print data on the label, said advancing means including label positioning means for providing a signal representative of the end of the label, means for periodically checking the speed of said motor, and jam detecting means including means for determining the number of times the speed of said motor has been checked, and means for indicating a jam when the number of times the speed of the motor was checked exceeds a predetemined number and if the signal representative of the end of the label has not been received.

4,680,079

PRINTED CIRCUIT BOARD LAMINATING APPARATUS

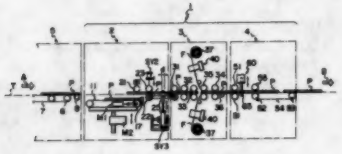
Shoji Tanaka, Oyama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1985, Ser. No. 711,635

Claims priority, application Japan, Mar. 16, 1984, 59-049232; Mar. 24, 1984, 59-055242; Mar. 26, 1984, 59-056150; Mar. 26, 1984, 59-057652; Mar. 26, 1984, 59-057653

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—353 12 Claims



1. A printed circuit board laminating apparatus for laminating a film on a surface of each of a plurality of baseboards corresponding to a printed circuit board comprising:

(a) laminating means for continuously feeding a long film, and continuously laminating the film on a surface of each baseboard; and

(b) baseboard feed means for arranging the plurality of baseboards, with a contstant gap therebetween, and feeding each baseboard to said laminating means at a first velocity, including

(i) a regular-feed mechanism for continuously feeding a first baseboard of the plurality of baseboards to said laminating means at the first velocity,

(ii) a quick-feed mechanism for feeding a second baseboard of the plurality of baseboards to a waiting position and then to said regular-feed mechanism at a second velocity higher than the first velocity,

(iii) a spacing mechanism for spacing said first and second baseboards, with the constant gap therebetween, and

(iv) a lifting mechanism for moving said quick feed mechanism and down between a lower position, in which the quick-feed mechanism feeds the first and second baseboards, to the waiting position, and an upper position, in which the quick-feed mechanism feeds the first and second baseboards, to said regular-feed mechansim.

4,680,080

APPARATUS FOR PRODUCING LABELS

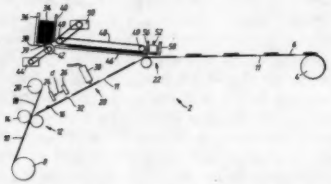
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, United Kingdom

Filed Sep. 27, 1985, Ser. No. 781,001

Claims priority, application United Kingdom, Sep. 27, 1984, 8424449

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—357 20 Claims



1. Apparatus for producing a succession of self-adhesive labels carried on a backing of release material, the apparatus comprising means for conveying along a pathway a laminar material comprising a succession of label base portions, each of which is coated on its reverse side with a pressure sensitive adhesive, and having a backing of a release material; detecting means situated along the pathway for detecting a succession of particular locations which are spaced along the length of the laminar material; an adhesive applying station situated along the pathway and including an adhesive applicator, which is operable in response to the means for detecting, for applying a layer of adhesive to a particular area on each label base portion; and a label applying station situated along the pathway downstream of the adhesive applying station, the label applying station including label applying means, which are operable in response to the means for detecting, for successively applying individual pre-printed labels to respective successive layers of adhesive so that a pre-printed label covers each area of each label base portion to which adhesive has been applied.

4,680,081

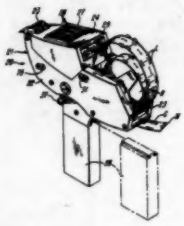
HAND HELD ELECTRICALLY SELECTABLE LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 798,260, Nov. 14, 1985, abandoned, which is a division of Ser. No. 674,105, Nov. 19, 1984, Pat. No. 4,591,404, which is a division of Ser. No. 512,820, Jul. 11, 1983, Pat. No. 4,497,682, which is a continuation of Ser. No. 268,320, May 29, 1981, abandoned. This application Oct. 23, 1986, Ser. No. 922,789

Int. Cl.[4] B41J *3/00*; B41F *1/08*

U.S. Cl. 156—384 12 Claims



1. A hand-held labeler adapter to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing having a front portion, a rear portion and a handle, a label applicator mounted on the front portion, label roll mounting means disposed at the rear portion, thermographic printing elements disposed in the housing for printing on the labels, means for delaminating printed labels, means for advancing the carrier web to bring the labels successively to the thermographic printing elements and the delaminating means, a keyboard on the housing, a control circuit for selectively energizing the printing elements, and wherein the handle depends downwardly of the front the rear portions and contains a rechargeable battery.

4,680,082

LABEL APPLICATOR

David A. Kearney, Keene, N.H., assignor to Markem Corporation, Keene, N.H.

Filed Oct. 4, 1985, Ser. No. 784,507

Int. Cl.[4] B65C *9/18, 9/28*

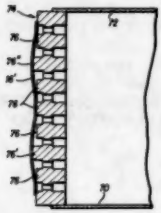
U.S. Cl. 156—497 6 Claims

1. An apparatus for receiving and applying labels, comprising:

an enclosure having a generally planar face plate formed with a plurality of openings therein communicating with the interior of the enclosure;

means for maintaining a partial vacuum within said enclosure in order to cause a label to adhere to the outside of the face plate;

means for causing the label to transfer from the face plate to a label receiving surface; and



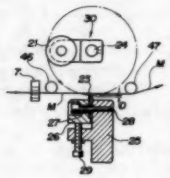
means on said face plate for causing the adhered label to bow outward from the plane of the face plate.

4,680,083

CUTTER DEVICE FOR A FILM STRIP ON A LAMINATE

Tadao Kashiwaba, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Apr. 10, 1985, Ser. No. 721,856
Claims priority, application Japan, Apr. 13, 1984, 59-74403
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—510 10 Claims



1. A cutter device for partially cutting a laminated strip comprising:

means for positioning the laminated strip along a path;

a stationary cutter assembly positioned at one side of the path and having a cutting surface disposed toward the laminated strip positioned along the path; and

a rotatable assembly positioned generally opposite the stationary cutter and on another side of the path opposite the one side, the rotatable assembly comprising a revolving roller for pushing the laminated strip against the cutting surface when the rotatable assembly rotates for partially cutting the laminated strip, said rotatable assembly comprising a rotatable drive shaft, the revolving roller being supported eccentrically relative to the drive shaft for pushing the laminating strip each time the drive shaft rotates.

4,680,084

INTERFEROMETRIC METHODS AND APPARATUS FOR DEVICE FABRICATION

Peter A. Heimann, Clifton; Joseph M. Moran, Berkeley Heights, and Ronald J. Schutz, Warren, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 21, 1984, Ser. No. 642,931
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—626 15 Claims

1. A method for fabricating a device, comprising the steps of:

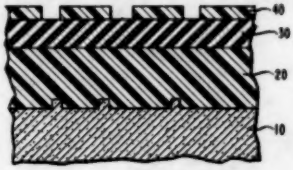
etching at least a portion of a first region of a substrate, which first region overlies a second region of said substrate;

monitoring said etching by illuminating an area of said first region being etched with light and detecting the intensity of at least a portion of the light reflected from said first region;

terminating said etching based on the detected intensity; and

completing the fabrication of said device,

Characterized In That



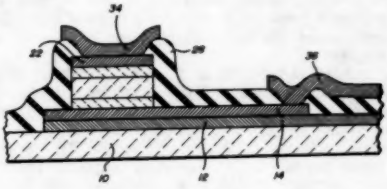
said illuminating light includes nonvisible light which is chosen in relation to said first and second regions so that said first region is substantially transparent, and said second region is substantially opaque, to said nonvisible light.

4,680,085

METHOD OF FORMING THIN FILM SEMICONDUCTOR DEVICES

Meera Vijan, Troy; John C. McGill, Rochester, and Paul N. Day, Troy, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Apr. 14, 1986, Ser. No. 851,756
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—643 74 Claims



1. A method of forming a thin film semiconductor device having at least one noncrystalline semiconductor layer, comprising the steps of:

(A) depositing said noncrystalline semiconductor layer over a substrate;

(B) forming a first conductive metal layer over first and second adjacent portions of said semiconductor layer;

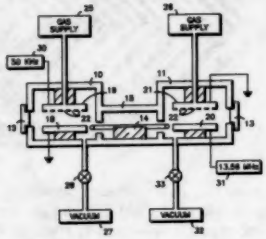
(C) removing a section of the first conductive metal layer which overlies said second portion of said semiconductor layer; and

(D) removing the second portion of said semiconductor layer by anisotropically etching said semiconductor layer, wherein the section of the first conductive metal layer which overlies said first portion of said semiconductor layer acts as a mask to prevent vertical etching of said first portion of said semiconductor layer, said etching being performed by directing accelerated reactive ions onto the surface of said one semiconductor layer and said mask, said ions being chemically reactive with said one semiconductor layer, whereby a steeply sloping sidewall of said semiconductor layer is formed.

4,680,086
DRY ETCHING OF MULTI-LAYER STRUCTURES

Patrick K. Thomas, Pflugerville; Dennis C. Hartman, Austin, and Jasper W. Dockrey, Pflugerville, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1986, Ser. No. 841,976
Int. Cl.[4] H01L 21/306, 21/308
U.S. Cl. 156—643 6 Claims



1. A method for dry etching a multi-layer structure comprising a refractory metal silicide overlying a polysilicon material overlying a dielectric material comprising the steps of:

forming a patterned photoresist layer overlying said refractory metal silicide layer of said multi-layer structure to protect portions of said silicide layer;

supporting a substrate bearing said multi-layer structure on a grounded electrode in a first parallel plate-type dry etch chamber;

energizing a first reactive gas mixture comprising at least one fluorine-containing compound in said first dry etch chamber with energy of a first RF frequency coupled to a power electrode in said first chamber to completely remove unprotected portions of said refractory metal silicide;

transporting said substrate from said first dry etch chamber to a second parallel plate-type dry etch chamber after unprotected portions of said refractory metal silicide have been completely removed to expose portions of said polysilicon;

supporting said substrate on a powered electrode in said second parallel plate-type dry etch chamber;

energizing a second reactive gas mixture comprising at least one chlorine-containing compound in said second dry etch chamber with energy of a second RF frequency higher than said first RF frequency coupled to said powered electrode to completely remove unprotected portions of said polysilicon; and

removing said substrate from said second dry etch chamber after exposed portions of said polysilicon have been completely removed wherein the lower energy of the first RF frequency and the support of the substrate on the grounded electrode are such that the silicide is etched rapidly and anisotropically, while the higher energy of the second RF frequency and the support of the substrate on the powered electrode are such that the polysilicon is eteched rapidly and anisotropically without substantially etching the dielectric material.

4,680,087
ETCHING OF DIELECTRIC LAYERS WITH ELECTRONS IN THE PRESENCE OF SULFUR HEXAFLUORIDE

Stephen M. Bobbio, Wake Forest, N.C., assignor to Allied Corporation, Morris Township, Morris County, N.J.

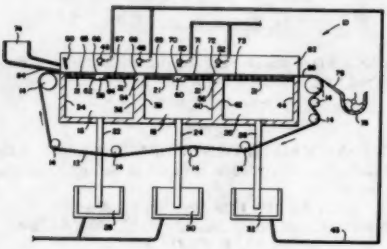
Filed Jan. 17, 1986, Ser. No. 819,651
Int. Cl.[4] C03C 15/00; C23F 1/02
U.S. Cl. 156—643 8 Claims

1. In a method of fabricating a semiconductor device wherein a pattern is etched in dielectric film or layer on a silicon substrate, the improvement comprising directing electrons onto the layer in a low pressure sulfur hexafluoride environment to generate a desired pattern in the dielectric layer.

4,680,088
PROCESS FOR REMOVING INK PARTICLES FROM PAPER PRODUCTS

Remberto P. Bastanzuri, Miami, Fla., assignor to Michael Scheck, Miami, Fla., a part interest

Filed Feb. 21, 1985, Ser. No. 703,950
Int. Cl.[4] D21C 9/06, 5/02
U.S. Cl. 162—4 9 Claims



1. A process for removing ink particles from an inked paper product comprising:

forming a slurry from the inked paper product;

flowing the slurry onto a surface of a semi-permeable conveyor having pores of sufficient size to pass liquid and the ink particles and retain the paper product on the surface of the conveyor;

establishing a pressure differential across the conveyor through the pores to draw liquid from the slurry and form a mat from the slurry;

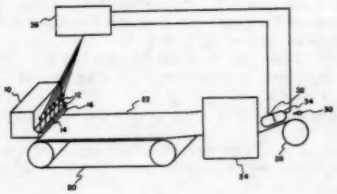
showering the mat with liquid in an area where substantially no pressure differential exists across a substantial portion of the conveyor through the pores and preventing substantial flow of liquid through pores of the conveyor in the area where the paper product is being showered to break the mat into a slurry and separate the ink particles from the paper product; and

removing the separated ink particles from the paper product.

4,680,089
PROCESS FOR CONTROLLING THE FORMATION OF SHEET MATERIAL

Gurcan Aral, Palo Alto, and Ramesh Balakrishnan, Cupertino, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 693,920, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,676, Sep. 4, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,859
Int. Cl.[4] D21F 7/06, 1/06
U.S. Cl. 162—198 5 Claims



1. A process for controlling the configuration of a thickness-

regulating member which is coupled to a plurality of actuators, the process comprising:

(a) determining the desired configuration of the thickness-regulating member;

(b) determining the actuator movements required to substantially obtain the desired configuration of the thickness-regulating member according to the following equation:

$$\overline{Z} = [A]^{-1}\frac{6EI}{K^3}[Ra] + [J]\,\overline{Y}$$

where:

$\overline{Z}$ = required actuator movements;

$\overline{Y}$ = required displacements of the thickness-regulating member at each actuator;

E = modulus of elasticity of the thickness-regulating member;

I = cross-sectional moment of inertia of the thickness-regulating member;

k = spring constant of an actuator;

l = distance between actuators;

[A] = a first predetermined matrix;

[J] = identity matrix;

[Ra] = a second predetermined matrix;

wherein said first and second predetermined matrices are determined by modeling a thickness-regulating member and actuator system as an elastic system, without basing the determination on any of the following parameters: spring constants of the actuators, elastic modulus of the thickness-regulating member, and cross-sectional moment of inertia of the thickness-regulating member; and,

(c) controlling the actuators based upon the required actuator movements.

4,680,090

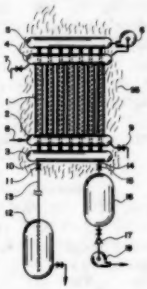
DIRECT HEAT RECYCLING REGENERATIVE STILL

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 492,445, May 6, 1983, and Ser. No. 647,365, Sep. 4, 1984, abandoned. This application Apr. 10, 1985, Ser. No. 721,655

Int. Cl.[4] B01D *1/06, 1/28*

U.S. Cl. 202—187 **23 Claims**



1. A distillation device comprising in combination:

(a) at least one raw fluid distributor header including at least one raw fluid inlet port;

(b) at least one distilled fluid collector header including at least one distilled fluid outlet port;

(c) at least one vapor collector header;

(d) at least one vapor distributor header;

(e) a plurality of twin tubings, each of said twin tubings comprising at least one evaporator tubing and at least one condenser tubing arranged in a parallel configuration wherein said twin tubing includes means for enhancing a conductive heat transfer between said evaporator tubing and said condenser tubing, wherein a plurality of said evaporator tubings included in said plurality of twin tubings connect said raw fluid distributor header and said vapor collector header to one another, and a plurality of said condenser tubings included in said plurality of twin tubings connect said distilled fluid collector header and said vapor distributor header to one another; and

(f) at least one fluid moving means connecting said vapor collector header to said vapor distributor header for forcibly moving vapor from said vapor collector header to said vapor distributor header;

whereby, raw fluid supplied to said plurality of evaporator tubings through said raw fluid distributor header and heated by thermal energy supplied to said plurality of twin tubings evaporates into vapor whereupon said vapor forcibly moved by said fluid moving means from said vapor collector header to said vapor distributor header condenses in said plurality of condenser tubings wherein condensate fluid is collected through said distilled fluid collector header and the latent heat released by the condensing vapor is directly transfered to said plurality of evaporator tubings.

4,680,091

APPARATUS FOR THE CONTINUOUS VACUUM CLEANING OF OIL

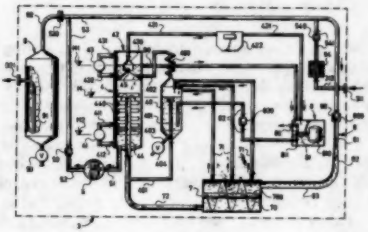
Josef Altmann, Domazlice, and Bohuslav Beran, Ledce, both of Czechoslovakia, assignors to ZLEHIT pri BAN, Sofia, Bulgaria

Filed Mar. 24, 1986, Ser. No. 843,063

Claims priority, application Czechoslovakia, Mar. 26, 1985, 2137-85

Int. Cl.[4] B01D *3/02*

U.S. Cl. 202—205 **6 Claims**



1. Apparatus for continuous vacuum cleaning of oil comprising

means designed for utilizing the combined action of quasistationary conditions generated by operation vacuum, and of non stationary conditions generated by a hydrodynamic cavitator sufficient to substantially increase the degree of release and separation of contaminants in oil from an electric transformer including

a container of an oil system connected to

a conservator by way of a connecting conduit which is connected to

a supply conduit which connects the connecting conduit of said container of an oil system and said conservator with

a vacuum cleaner which has an inlet filter arranged before

a hydrodynamic cavitator which leads to

a separator and then to

a main chamber with

an accumulation extension, which has attached a circuit arrangement comprising

pick-up means for the oil level controlled by

an attached electric motor, said accumulation extension is also connected to

an auxiliary chamber with a condenser and said accumulation extension is further connected to

a retention chamber,

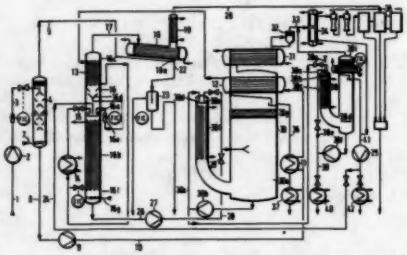
a collecting chamber,
a pump,
an oil cooler by
conduits and
valves, and a throttling means and the outlet of said vacuum cleaner is finally connected over
a discharge conduit and then to
an outlet conduit to oil coolers.

4,680,092

PROCESS FOR DEGASSING, DEHYDRATING AND PRECUT SEPARATION IN STRAIGHT-RUN DISTILLATION OF CRUDE FATTY ACIDS

Hermann Stage, Ludgeristrasse 9, 4400 Muenster, Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,288
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236985
Int. Cl.[4] B01D *3/38*; C11C *1/10*
U.S. Cl. 203—22 **8 Claims**



1. A process for degassing, dehydrating and separating precut during a straight-run distillation of crude fatty acids, said process comprising degassing the crude fatty acids in a first stage by effecting a counter current flow between the crude fatty acids and a stripping steam at a temperature below 100° C. and at a pressure between 67 and 400 mbar so as to avoid any appreciable dehydration or precut separation, feeding the degassed fatty acids to a dehydrating and precut separating second stage comprising a precut column having a stripping section with a distributor and a falling film dephlegmation section which is mounted above the distributor, the crude fatty acids being fed into the second stage near the distributor, heating the crude fatty acids in the second stage to form crude fatty acid vapors containing low boiling precut and water, partially condensing the vapors in the dephlegmation section to create reflux of fatty acids while the low boiling precut and water remain completely vaporized, withdrawing the vaporized low boiling point precut and water from the dephlegmation section, condensing the vaporized precut and water, and collecting the condensed precut and water in a decantation tank.

4,680,093

METAL BONDED COMPOSITES AND PROCESS

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

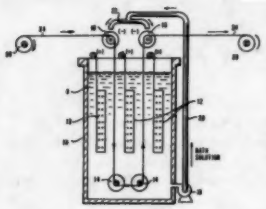
Continuation-in-part of Ser. No. 358,637, Mar. 16, 1982. This application Jun. 24, 1983, Ser. No. 507,603
Int. Cl.[4] C25D *7/00*
U.S. Cl. 204—28 **16 Claims**

1. A process for the production of a metal composite, said process comprising:

(a) providing a plurality of electrically conductive core filaments;

(b) immersing at least a portion of the length of said filaments in a solution capable of electrolytically depositing at least one metal;

(c) providing a quantity of electricity and applying an external voltage between the filaments and an electrode immersed in the solution in excess of 10 volts whereby (i) the



metal nucleates substantially uniformly onto the surface of the filaments and (ii) there is produced a substantially uniform, firmly adherent, continuous layer of metal on said core; and

(d) building up a metal matrix around the metal coated fibers to form a composite material.

4,680,094

METHOD FOR PRODUCING ALUMINUM, ALUMINUM PRODUCTION CELL AND ANODE FOR ALUMINUM ELECTROLYSIS

Jean-Jacques Duruz, Geneva, Switzerland, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Feb. 13, 1986, Ser. No. 829,436
Claims priority, application Austria, Feb. 18, 1985, 810064/85
Int. Cl.[4] C25C *3/12, 7/02*
U.S. Cl. 204—67 **19 Claims**

1. A method of producing aluminum by electrolysis of alumina dissolved in a molten cryolite bath using a dimensionally stable anode comprising a substrate which is unstable under the conditions of the aluminum electrolysis, said anode substrate having a coating layer having imperfections through which substrate components may diffuse, which method comprises providing as said coating layer on said anode substrate a layer containing cerium oxyfluoride that is substantially continuous and stable under said electrolysis conditions and that is preserved by maintaining cerium within the electrolyte, and supplying to said coating layer imperfections a substance supplied by providing one or more of an alkali or alkaline earth metal compound to said electrolyte, whereby contamination of product aluminum by anode substrate components diffusing through imperfections in the coating layer is inhibited.

4,680,095

CONTINUOUS PREPARATION OF DIALKANESULFONYL PEROXIDE

Gregory A. Wheaton, Gloucester, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 3, 1986, Ser. No. 926,286
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—79 **10 Claims**

1. A process for the continuous preparation of dialkanesulfonyl peroxide by continuously electrolyzing a solution of an alkanesulfonic acid having 1–4 carbons at a sufficient current density to produce dialkanesulfonyl peroxide of the structure $RSO_2—O—O—O_2SR$ where R is alkyl of 1–4 carbons, wherein the concentration of the alkanesulfonic acid is between 50% and 100% by-weight, in an undivided continuous flow electrolysis cell at an elevated temperature at which a substantial portion of the product dialkanesulfonyl peroxide is in solution, continuously removing the alkanesulfonic acid/dialkanesulfonyl peroxide product mixture from the electrolysis cell to a cooling zone where the product mixture is cooled

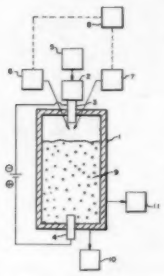
below the temperature in the electrolysis cell to precipitate the dialkanesulfonyl peroxide product, continuously recovering the insoluble solid dialkanesulfonyl peroxide product from the alkanesulfonic acid, and continuously recycling the alkanesulfonic acid solution back to the electrolysis cell.

4,680,096

PLASMA SMELTING PROCESS FOR SILICON

Vishu D. Dosaj, Midland, and Alvin W. Rauchholz, Thomas Township, Saginaw County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 26, 1985, Ser. No. 813,330
Int. Cl.[4] C01B *33/02*
U.S. Cl. 204—164 **36 Claims**



1. A process for producing silicon using a gas plasma as the energy source, said process comprising

(I) generating a gas plasma in a reactor utilizing a transferred arc configuration in which a minimum of gas is utilized to form the plasma;

(II) feeding silicon dioxide and a solid reducing agent directly into the reactor and to the plasma;

(III) passing the plasma gas, the silicon dioxide, and the solid reducing agent into a reaction zone of the reactor;

(IV) recovering molten silicon and the gaseous by-products from the reaction zone.

4,680,097

METHOD OF PREVENTING UNDESIRABLE GAS GENERATION BETWEEN ELECTRODES OF AN ELECTROCOAGULATION PRINTING SYSTEM

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Inc., St. Laurent, Canada

Filed Sep. 22, 1986, Ser. No. 909,729
Int. Cl.[4] C25D *13/04, 13/18, 13/20*
U.S. Cl. 204—180.1 **20 Claims**

10. In a method of reproducing an image by electrocoagulation of an electrolytically coagulable colloid, wherein a layer of an aqueous colloidal dispersion containing an electrolytically coagulable colloid, water and a soluble electrolyte is interposed between at least one pair of opposite, electrolytically inert negative and positive electrodes spaced from one another by a gap filled with said aqueous colloidal dispersion and said electrodes are electrically energized to pass electric current through the layer at selected points to cause point-by-point selective coagulation and adherence of the colloid on the positive electrode and formation of a series of corresponding dots of coagulated colloid representative of a desired image, the improvement which comprises coating the positive electrode with an olefinic substance to form micro-droplets thereof on the surface of the positive electrode prior to electrically energizing said electrodes such that upon electrical energization hydrogen generated as a result of electrolysis is consumed by reaction with said olefinic substance, said reaction being carried out in the presence of a metallic oxide catalyst, thereby preventing undesirable hydrogen generation and accumulation at the negative electrode.

4,680,098

AQUEOUS RECOVERY OF COBALT OR COBALT AND MANGANESE FROM SOLUTION ALSO CONTAINING OXYGENATED AROMATIC COMPOUNDS

Yuehsiung Chang, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 712,975, Mar. 18, 1985. This application Apr. 11, 1986, Ser. No. 850,534
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **22 Claims**

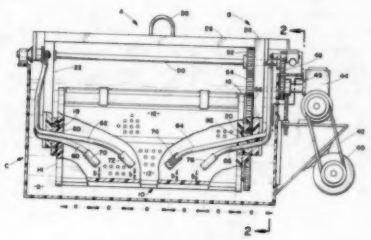
1. An electrodialysis process for recovery of cobalt and manganese ions from a diluting solution comprising said ions and contaminants, which comprises feeding said solution to an electrodialyzer separation stack which comprises an anode channel formed by an anode and a cation permeation membrane and at least one, three-channel repeating unit wherein each repeating unit having in sequence channels A, B, and C wherein this repeating unit comprises a Channel A formed by two cation permeation membranes, a Channel B formed by a cation permeation membrane and an anion permeation membrane, and a Channel C formed by an anion permeation membrane and either a cation permeation membrane or a cathode, passing an anolyte comprising an aqueous solution of an acid through the anode channel, feeding diluting solution through the A channels, feeding an electrolyte through the B channels, feeding a catholyte comprising an aqueous solution of a carboxylate produced by reaction of a metallic hydroxide and an organic acid selected from a group consisting of formic, acetic, oxalic, lactic, tartaric, citric, benzoic and phthalic acids in a concentration of at least about 0.01N, through the C channels and removing a concentrate comprising a solution of cobalt and manganese substantially free of contaminants as an effluent from the B channels.

4,680,099

ELECTROPLATING APPARATUS

Raymund Singleton, 31653 Electric Blvd., Avon Lake, Ohio 44012

Filed Apr. 7, 1986, Ser. No. 848,942
Int. Cl.[4] C25D *17/20*
U.S. Cl. 204—213 **3 Claims**



1. An electroplating apparatus comprising:

a work barrel having a first side wall and a second side wall and a longitudinal wall connected to said side walls with at least one of said walls being constructed of a perforate panel, said barrel being pivotal upon a longitudinal axis thereof, adapted to receive articles to be electroplated therein and further adapted to be contained in an associated tank;

a means for causing rotation of said barrel about said longitudinal axis; and,

at least four danglers of conductive, insulated cable for carrying an electrical current, said danglers having fixed ends located outside said barrel and electrically connected

to and pivotal about a fixed conductor, said danglers having free ends extending through side walls of said barrel at generally said longitudinal axis, said free ends having an entrance angle to said longitudinal axis so that said danglers remain substantially free of interference from said side walls when said side walls are rotated with said barrel, each of said free ends terminating radially outward of said longitudinal axis at a termination angle approximating 45° to said longitudinal axis, said danglers geing longitudinally positioned generally uniformly within said work barrel and at a generally uniform distance from said longitudinal wall, said danglers including a contactor assembly adapted to contact and provide an electrical path to articles in said barrel as said barrel is rotated about its longitudinal axis.

4,680,100

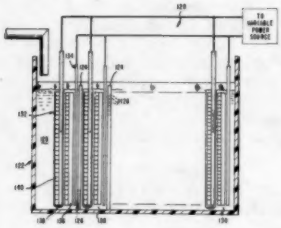
ELECTROCHEMICAL CELLS AND ELECTRODES THEREFOR

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 541,611, Oct. 13, 1983, abandoned, which is a continuation of Ser. No. 507,604, Jun. 24, 1983, abandoned, which is a continuation of Ser. No. 358,637, Mar. 16, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 604,397

Int. Cl.[4] C25C *7/02;* **C25B** *9/00, 11/12, 11/02*

U.S. Cl. 204—228 **36 Claims**



22. A discretionary electro-chemical cell for the plating of at least one selected metal in an electrolytic solution onto an electrode, comprising:

a tank for containing the electrolyte;

a cathode including a plurality of fibers, wherein each of said fibers has a thin, uniform and firmly adherent electrically conductive metallic coating thereon; and

an anode.

23. The discretionary cell as defined in claim **22**, further including a variable power source connected to said cathode and anode for regulating voltage, so that the voltage is set at a level to cause a selected metal in the electrolyte to plate on the cathode.

4,680,101

ELECTROLYTE PERMEABLE DIAPHRAGM INCLUDING A POLYMERIC METAL OXIDE

W. Bruce Darlington, Wadsworth, and Donald W. DuBois, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 4, 1986, Ser. No. 926,688

Int. Cl.[4] C25B *13/00*

U.S. Cl. 204—295 **13 Claims**

1. A liquid permeable diaphragm for an electrolytic cell, the diaphragm comprising a major amount of fibrillated polyfluorocarbon, a minor amount of a perfluorinated ion exchange material and a polymeric metal oxide selected from the group consisting of polytitanic acid, polyzirconic acid, polysilicic acid, polyaluminic acid or mixtures thereof.

4,680,102

ELECTROPHORETIC APPARATUS

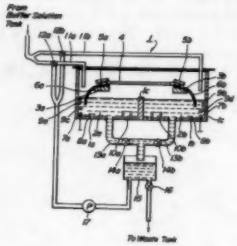
Shiro Ishiwatari, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Nov. 22, 1985, Ser. No. 800,683

Claims priority, application Japan, Nov. 28, 1984, 59-251172

Int. Cl.[4] C25D *13/00;* **G01N** *21/00*

U.S. Cl. 204—299 R **10 Claims**



1. An electrophoretic apparatus for effecting electrophoresis comprising:

means for wetting a substrate made of cellulose acetate with a buffer solution;

means for applying a sample on the substrate;

means for placing the substrate in an electrophoretic chamber containing a buffer solution;

means for conducting an electric current through the substrate to form an electrophoretic image on the substrate;

means for dying and decoloring the substrate to make said electrophoretic image visible;

means for photometering the visable electrophoretic image;

means for storing a standard expansion length of a standard electrophoretic image;

means for measuring an expansion length of the electrophoretic image of the sample;

means for comparing the expansion length of the electrophoretic image of the sample with the standard expansion length of the standard electrophoretic image to derive a variation in the expansion length of the electrophoretic image of the sample; and

means for adjusting electrophoretic current, electrophoretic voltage or electrophoretic time, in accordance with said variation in the expansion length of the electrophoretic image.

4,680,103

POSITIVE PARTICLES IN ELECTROPHORETIC DISPLAY DEVICE COMPOSITION

Beilin Solomon I., Oakland, and Long K. Truong, San Jose, both of Calif., assignors to EPID. Inc., Florham Park, N.J.

Filed Jan. 24, 1986, Ser. No. 822,297

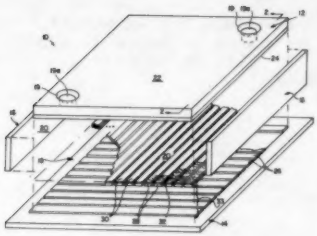
Int. Cl.[4] C25D *1/12;* **G03G** *13/00;* **C23B** *13/00;* **B01K** *5/02*

U.S. Cl. 204—299 R **20 Claims**

1. A composition useful in electrophoretic display devices comprising:

a plurality of discrete particles, substantially each of the

particles including pigment and an organosilane attached thereto, the attached organosilane including a positively



charged ionic functional moiety covalently bonded therein.

4,680,104

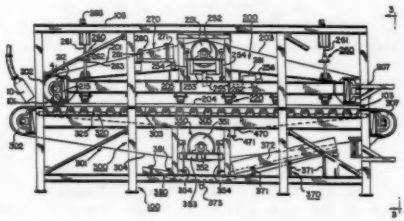
APPARATUS FOR DEWATERING CLAY FILTER CAKE

Albert C. Kunkle, Macon, and Edgar J. Maxwell, III, Thomson, both of Ga., assignors to J. M. Huber Corporation, Borger, Tex.

Continuation of Ser. No. 619,330, Jun. 11, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 857,401

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—300 R **16 Claims**



1. An apparatus for dewatering a liquid containing clay material to form a clay cake of at least approximately 70% solids content comprising,

at least two electrically conductive conveying mechanisms, each having an outer clay material contacting surface and an inner supported surface, positioned adjacent to but spaced from each other,

means for moving said electrically conductive conveying mechanisms in an endless path of movement in the same direction and at the same linear speed,

means for introducing liquid containing clay material into the space between and into direct contact with said opposed electrically conductive conveying mechanism for movement therewith and therebetween along at least a portion of said endless path of movement,

means for establishing an electric field between said electrically conductive conveying mechanisms of a magnitude sufficient to electrokinetically drive at least a portion of the liquid from the clay material passing therewith and therebetween, and

means for maintaining continuous contact between said clay material and said electrically conductive conveying mechanisms without subjecting said clay material to a pressure force substantially in excess of the contact pressure while moving therewith and therebetween along at least a portion of said endless path of movement to permit the electrokinetic forces to drive a sufficient amount of liquid from the clay material to form a clay cake having at least approximately 70% solids material.

4,680,105

HYDRODEMETALLIZATION OF OILS WITH CATALYSTS COMPRISING NICKEL PHOSPHATE AND TITANIUM PHOSPHATE

Daniel M. Coombs, Borger, Tex.; Ted H. Cymbaluk, Bartlesville, Okla.; Brent J. Bertus, Bartlesville, Okla., and Simon G. Kukes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 5, 1986, Ser. No. 859,980

Int. Cl.[4] C10G *45/00;* **B01J** *27/185*

U.S. Cl. 208—251 H **17 Claims**

1. A process for demetallizing a substantially liquid hydrocarbon-containing feed stream comprising the step of contacting said feed stream, which also contains metals, with a free hydrogen containing gas in the presence of a solid catalyst composition comprising a coprecipitate of nickel phosphate and titanium phosphate, under such contacting conditions as to obtain a hydrocarbon-containing liquid product stream having a reduced concentration of metals.

4. A process in accordance with claim **1**, wherein said solid catalyst composition comprises a coprecipitate of nickel(II) orthophosphate and titanium(IV) orthophosphate.

14. A process in accordance with claim **1** wherein a decomposable compound of a metal selected from the group consisting of transition metals of Group IB, Group IIB, Group IIIB, Group IVB, Group VB, Group VIB, Group VIIB, and Group VIII of the Periodic Table has been added to said hydrocarbon-containing feed stream.

4,680,106

ELECTRODYNAMIC METHOD FOR SEPARATING COMPONENTS OF A MIXTURE

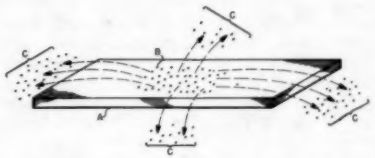
Louis C. Weiss; Devron P. Thibodeaux, and Mary Ann Godshall, all of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 527,730, Aug. 30, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,113

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] B03C *7/00*

U.S. Cl. 209—1 **8 Claims**



1. An electrodynamic method for separating components of a mixture comprising:

(a) feeding onto a horizontal electric undulating traveling wave contact panel a mixture of particles, said mixture comprised of negligibly charged and charged particles;

(b) energizing the panel with sufficient A.C. voltage for sufficient time to impart different charge to mass ratios to the individual particles;

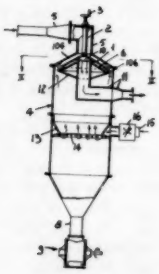
(c) increasing the potential for sufficient time to a separation voltage; said separation voltage being that which is sufficient to move said charged particles away from said negligibly charged particles;

(d) separating the individual particles by cyclically repeating steps (b) and (c) until all of the charged particles are moved off the panel and the negligibly charged particles remain on the panel.

4,680,107
DEVICE FOR SEPARATION OF THE COMPONENTS OF EDIBLE MEALS

Umberto Manola, Brescia, Italy, assignor to The Protein's Technology S.p.A., Campobasso, Italy

Filed May 22, 1984, Ser. No. 612,830
Int. Cl.[4] B07B *4/02, 11/04*
U.S. Cl. 209—139.2 **3 Claims**



1. Apparatus for the physical separation of components of meal to be used as edible or as chemical-pharmaceutical products, comprising

(a) a conical, downwardly diverging tray (1) arranged coaxially in the upper portion of a vertical, substantially cylindrical container (4) having at its bottom a discharge conduit (8) controlled by a valve (9);

(b) means for feeding said meal to be treated above said conical tray (1) so that it will be evenly distributed over a round angle;

(c) a further conical structure (6) also diverging downwardly, arranged at a short distance below said conical tray (1) and secured to said container (4), said conical structure (6) having an upwardly bent peripheral edge (106) extending beyond the periphery of said conical tray (1) and closely spaced from an inner side surface of said container (4);

(d) means (2, 3) for adjusting the distance between said conical tray (1) and said conical structure (6) so as to adjust the rate of flow traversing them;

(e) said conical structure (6) having a bottom (12) formed by a conical upwardly diverging counter-member, so as to avoid turbulence which could affect operation of said apparatus;

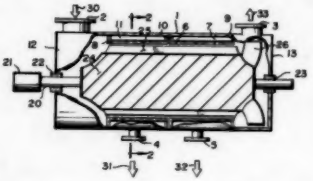
(f) at least one opening (10) in said conical structure (6) connected to a conduit (11) which passes in airtight manner out of said container (4) and is connected to a suction means;

(g) an annular air inlet means (13) arranged below said conical structure (6) coaxially therewith and connected to at least one conduit (15) opening to the atmosphere under the control of valve means (16), whereby, due to suction exerted by said suction means, an ascending flow of air is formed that permits heavier particles of said meal to drop downwardly and retains lighter particles in suspension to follow an air stream flowing out of said apparatus, through said conical member (1, 6) and said conduit (11) connected to said at least one opening (10).

4,680,108
SCREENING DEVICE

Bjorn Ahs, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Mar. 4, 1986, Ser. No. 836,123
Claims priority, application Sweden, Mar. 4, 1985, 8501030
Int. Cl.[4] B07B *1/04*
U.S. Cl. 209—273 **20 Claims**



1. A device for screening a fluidizible suspension comprising:

a housing including a main inlet and a main outlet;

a rotor having a plurality of ribs formed thereon;

stationary screen means operatively disposed in said housing between said main inlet and outlet; said stationary screen means defining, with said housing, a chamber;

means for mounting said rotor in said housing for rotation about an axis, with said ribs rotating past said stationary screen means with a small clearance between said stationary screen means and said ribs;

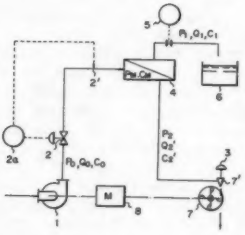
means for effecting primary and secondary screening within the same device, comprising means on the outlet side of said screen for dividing said chamber into a plurality of accept chambers; and

an accept outlet operatively associated with each accept chamber and extending outwardly from said housing.

4,680,109
MEMBRANE SEPARATOR

Koichi Yamada, Tokyo; Ichiro Hiraiwa, Kanagawa; Shin Taniguchi, Tokyo, and Toshinari Zengo, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed May 17, 1985, Ser. No. 744,008
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—103 **6 Claims**



1. A membrane separator provided with a pump for pressurizing a feed solution, a semipermeable membrane, a pressure regulationg valve disposed in a pipe between said pump and semipermeable membrane, and a power recovering means disposed downstream of the semipermeable membrane at the concentrated solution side, which is adapted to obtain a dilute solution and a concentrated solution by separating the solute from the solution through the semipermeable membrane, said membrane separator having:

a flow rate controlling apparatus provided with a control circuit which calculates an operation point including

theoretical pressure values and theoretical flow rate values from the solute concentration and osmotic pressure in the feed solution and the minimum required power at a predetermined dilute or concentrated solution flow rate from a performance curve of the pump, a performance curve of the power recovery means, and the relationship between the concentration of the solute and osmotic pressure in the feed solution;

specific pressure and flow rate detecting means which provide specific values to said control circuit to perform the calculations;

a means for regulating said pressure regulating valve in response to the calculated values produced by said control circuit; and

a means for regulating said power recovery means in response to the calculated valves produced by said control circuit to minimize the difference between the required power of the pump and the power recovered by the power recovering means.

4,680,110

FILTER BLOCK MOUNTED FUEL PROCESSOR APPARATUS

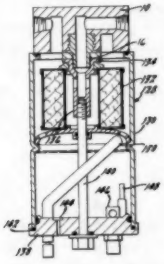
Leland L. Davis, Saline, Mich., assignor to Davco Manufacturing Corporation, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 573,292, Jan. 23, 1984, Pat. No. 4,539,109, which is a continuation-in-part of Ser. No. 463,041, Feb. 1, 1983, Pat. No. 4,495,069, which is a continuation-in-part of Ser. No. 287,149, Jul. 27, 1981, Pat. No. 4,428,351. This application Jun. 25, 1984, Ser. No. 624,413

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.[4] B01B *35/18*

U.S. Cl. 210—114 **35 Claims**



1. A unitary fuel processing and filtering unit, particularly for diesel fuel and operative to separate out water and impurities from the fuel adapted to be mounted to a mounting head having a fuel inlet passage and a fuel outlet passage comprising a housing including a lower portion defining a combined heating and sediment chamber, a concentric annular shaped filtering means positioned within an upper portion of said housing, a top plate having a fuel inlet and fuel outlet, means for conducting said fuel from said top plate inlet to said chamber, and means defining a passage for conducting fuel from said chamber to said filtering means, characterized by heating means in said lower portion operative to heat the incoming fuel by direct contact therewith in said chamber, said heating means including a heated portion in close proximity to said passage, and said heating means extends through a substantial part of the lower portion.

4,680,111

SEWAGE TREATMENT EQUIPMENT WITH ACTIVATED SLUDGE PROCESS BEDS

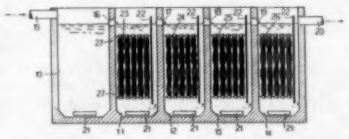
Iwao Ueda, 416, Nanba-cho, Matsubara-sagaru, Nishikiyama-chi-dori, Shimogyo-ku, Kyoto, Japan, assignor to Iwao Ueda and Chie Ueda, both of Kyoto, Japan

Filed Jul. 18, 1986, Ser. No. 886,923

Claims priority, application Japan, Jul. 24, 1985, 60-164661

Int. Cl.[4] C02F *3/06*

U.S. Cl. 210—150 **3 Claims**



1. In a sewage treatment equipment with activated sludge process beds in which a plurality of treatment tanks are arranged in a row each communicating with an adjacent tank through a passage, and each of the treatment tanks comprises a plurality of activated sludge process beds disposed vertically above an aeration pipe which is connected with an air in-flow pipe and disposed at the bottom of each tank, each of the activated sludge process beds comprising a cylindrical core composed of a hard synthetic resin resistant to corrosion over a long period of immersion in sewage water, said cylindrical core being wrapped with a porous member, said core being tightened by tightening means, the improvement comprising: an outer peripheral area of the cylindrical core wrapped with the porous member in each activated sludge process bed being increased tank by tank according to disposition of the tanks so as to give variety to kinds of bacteria, breeding ratio between aerobic bacteria and anaerobic bacteria and distribution thereof tank by tank in order.

4,680,112

APPARATUS FOR THE LIQUID TREATMENT OF SOLIDS

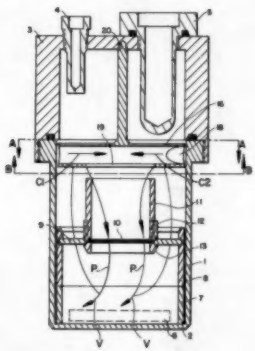
Alan Carrol, London, United Kingdom, assignor to Trenchbond Limited, United Kingdom

Filed Dec. 21, 1984, Ser. No. 685,146

Claims priority, application United Kingdom, Dec. 23, 1983, 8334304

Int. Cl.[4] B01D *35/18*

U.S. Cl. 210—179 **12 Claims**



1. A separator apparatus for the separation at ambient or elevated temperatures and pressures of a mixture of solid substances by treatment with a solvent, in which mixture one or

more of the components thereof is substantially insoluble under the selected operating conditions, the apparatus comprising:

a pot having a bottom wall and generally cylindrical sidewall extending upwardly from the bottom wall, the top of the sidewall defining a mouth;

a lid for closure and pneumatic sealing of said mouth when the apparatus is in use;

horizontally rotational stirring means arranged in the pot in contact with or in proximity to said bottom wall;

heating means; and

temperature responsive means for controlling the heating means;

wherein the pot contains a separator assembly comprising a generally central receptable for holding said solid mixture, the receptable including a bottom wall permeable to said solvent but impermeable to said solid mixture and a sidewall extending upwardly from the bottom wall, the separator assembly further comprising one or more spokes extending outwardly from said receptacle for upward passage therethrough of a vortex of the solvent; wherein there are support means compatible with said vortex for supporting the spokes at the outer end regions thereof and arranged so as to support the separator assembly with the base of the receptacle and the spokes spaced above the bottom wall of the pot to define between the bottom wall of the pot and the base of the receptacle and the spokes a space for holding the solvent and the said stirring means in the said solvent; wherein in use the stirring means induces a solvent vortex which runs up to above the top of the separator assembly; and wherein a duct is disposed transversely above the separator assembly so that the duct will not be moved in use by the force of the said vortex thereon, which duct has a length such as to define a small clearance between the ends thereof and the internal sidewall of the pot and has defined at its ends inlets for the solvent vortex, an outlet being defined in the bottom of the duct above the receptacle for the solvent to pour down onto the mixture therein.

4,680,113

SIEVE ARRANGEMENT FOR RECOVERING CLEANING PARTICLES FROM A COOLING-WATER STREAM DOWNSTREAM OF A HEAT EXCHANGER

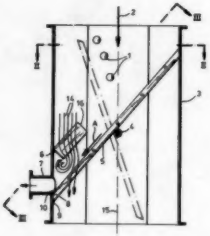
Klaus Eimer, Ratingen, and Wolfgang Gebhardt, Duisburg, both of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 491,034, May 3, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,825

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216443

Int. Cl.[4] B01D *35/18*

U.S. Cl. 210—181 **6 Claims**



1. An apparatus for recovering cleaning particles from a liquid stream downstream of a heat exchanger, said apparatus comprising:

a cylindrical duct,

traversed by a fluid stream containing particles therein in a first flow direction along a path of the stream, and forming a housing having a housing wall formed with an interior wall surface surrounding an axis of the duct;

at least one sieve having a front surface and a back surface and having along at least a part of its periphery an elliptical configuration, said sieve being pivotally mounted in said housing for swinging movement, about an axis transverse to said flow direction, between (i) an operative position wherein said sieve is inclined to said flow direction with said front surface generally facing upstream for contact thereof by said particles in said stream to cause said particles to move along said sieve to a downstream region thereof and toward the interior wall surface of said housing, and (ii) an inoperative position wherein said sieve is inclined to said flow direction with said back surface generally facing upstream for reverse flow of liquid through said sieve to cause contaminants to be removed from said front surface of said sieve;

a means fastened to and cooperating with said interior wall surface for forming an elliptical seat having an elliptical contour for said part of said periphery of said sieve, said elliptical seat being located in a position enabling engagement of said seat by said sieve upon the latter being swung to said operative position thereof;

a particle outlet opening into said housing through the housing wall just upstream of said location of said seat for permitting particles moving along said sieve to exit from said housing; and

a deflector plate projecting from said interior wall surface of said housing into the path of said stream, said plate being located upstream of and spaced from both said outlet and said seat, said plate being a curved sheet-metal member following the elliptical contour of said seat and having a simple curvature with a radius of curvature intersecting the axis of said duct, said deflector plate having upstream and downstream planar surfaces, a first edge connected to said interior wall surface along a contour complementary to said elliptical seat and a free end extending toward a center of said duct and terminating at a point downstream of the connection of said first edge of said deflector plate so that said deflector plate is inclined toward said first flow direction, said upstream and downstream planar surfaces lying in a plane which is perpendicular to the surfaces of said sieve when said sieve is in said operative position, said plate defining with the portion of said wall proximate to said downstream surface of said plate a wedge-shaped compartment open toward said sieve and converging outwardly away from the latter for inducing vortex formation between said plate and said sieve along said downstream planar surface for inducing the movement of said particles along said front surface of said sieve to said outlet.

4,680,114

WATER PURIFICATION APPARATUS

John Hayes, Berkshire, United Kingdom, assignor to Tarn-Pure Limited, Buckinghamshire, England

PCT No. PCT/GB84/00206, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00034, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 14, 1984, Ser. No. 700,880

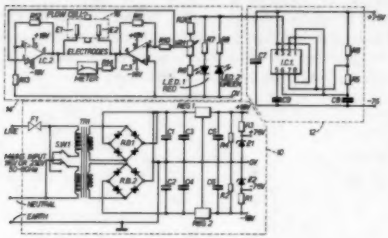
Claims priority, application United Kingdom, Jun. 14, 1983, 8316213

Int. Cl.[4] C02F *1/46*

U.S. Cl. 210—192 **7 Claims**

1. Water purification apparatus comprising a chamber having an inlet for receiving water to be purified and an outlet for discharging purified water, said inlet and said outlet being aligned such that an imaginary straight line passes therethrough; two parallel rod electrodes mounted in the chamber so as to be disposed with their axes aligned in parallel with said imaginary straight line and spaced apart on either side of said straight line whereby there is formed an unimpeded flow path between the two electodes for flow of water between the inlet

and the outlet, said electrodes containing a metal whose ions have purifying properties when present in the water; and cir-



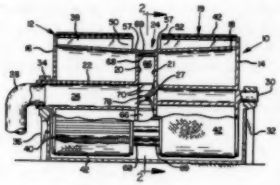
cuitry connected to said electrodes for maintaining a stable current between said electrodes.

4,680,115

FILTRATE DISCHARGE ACCELERATOR SYSTEM FOR CENTER VALVE FILTER DRUMS

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Filed Dec. 23, 1985, Ser. No. 812,910
Int. Cl.[4] B01D *33/06*
U.S. Cl. 210—247 **13 Claims**



1. In a center valve rotary drum filter for separating wood pulp from its filtrate, including means for supplying subatmospheric pressure, the drum having means defining axially extending surface filtrate channels arranged about the periphery of the drum, the filtrate channels opening into a common central circumferential valve opening, the valve opening being in fluid communication with a drainage conduit centrally disposed and extending axially within the drum, said drainage conduit being in communication with said subatmospheric pressure supply means, the filter further including a stationary valve member seated within a peripheral arcuate segment of the valve opening to close off surface filtrate channels leading to said segment from communication with said subatmospheric pressure supply means, said valve opening being defined by a pair of axially spaced radially extending flow-confining walls, the improvement comprising:

a plurality of generally radially disposed baffle means circumferentially spaced apart and positioned within said valve opening downstream of the stationary valve, said baffle means extending between the flow-confining walls and subdividing the valve opening into generally radial discrete filtrate flow channels for channelling filtrate flow from the surface filtrate channels into means defining a central opening of said drainage conduit; and

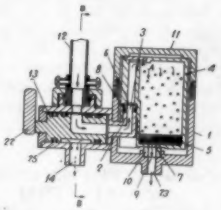
curved flow passage means between said flow-confining walls, said flow passage means being curved toward the central axis of the drainage conduit for directing filtrate flow to the drainage conduit.

4,680,116

WATER PURIFIER APPARATUS

Minoru Kamiwada, Fukuoka; Kazuyuki Saruwatari, Ogoori; Kazuaki Shimada, and Harumi Higashizima, both of Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 8, 1985, Ser. No. 731,794
Claims priority, application Japan, May 8, 1984, 59-92251; May 11, 1984, 59-95002; May 11, 1984, 59-95041; May 16, 1984, 59-97993
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—282 **17 Claims**



1. A water purifier apparatus comprising:

(a) a body having a raw water outlet and a purified water outlet conduit;

(b) a cartridge disposed in said body and housing a filter material, said cartridge having a raw water inlet and a purified water outlet with an enclosed water passage extending therebetween; and

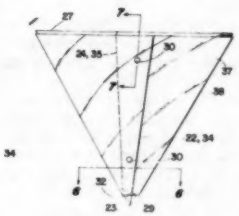
(c) said raw water outlet of said body and said raw water inlet of said cartridge being coupled to each other in a watertight manner and said purified water outlet of said cartridge being coupled to said purified water outlet of said body in a watertight manner.

4,680,117

YOGURT SEPARATOR DEVICE

Richard B. Freeman, Gainesville, Fla., assignor to The Gainesville 1920 Corporation, Gainesville, Fla.

Filed Oct. 18, 1985, Ser. No. 788,865
Int. Cl.[4] B01D *23/28*
U.S. Cl. 210—469 **5 Claims**



1. In a yogurt separator device for separating and removing the whey from yogurt, the combination of a flexible fine-mesh screen formed of spaced filaments of synthetic resin, said screen being initially of substantially flat or planar form and providing a configuration presenting edge portions opposed to each other; said screen being formable into an operative tapered yogurt-receiving filter cup with a bottom apex by bringing said opposed edge portions into overlapping relationship to each other; means for securing said edge portions against displacement from said overlapping relationship, whereby the whey drains through said cup while the residue is removably retained thereby; a flexible imperforate self-sustaining backing

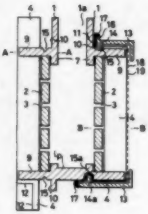
element of synthetic resin having a nominal central apex opening to receive the bottom apex to said filter cup and a configuration in planar form which is generally the same as that of said screen, said backing element being impervious to liquid and disposed in substantially laminar relationship to said screen and having edge portions opposed to each other, the portion of the backing element between the opposed edge portions being continuous and free of openings radially outwardly of said central opening; and second means for securing said backing element to said screen, said backing element being formable into a tapered bottom-opening cup-shaped container member external to said cup by bringing said opposed edge portions of said backing element into overlapping relationship with each other; the mesh openings of said screen having a size in the range of from 200 to 400 microns such that a thin film of liquid is formed over each opening by surface tension interaction between the whey and the synthetic resion of said filaments and a wetting action is created at the interface between the fine-mesh screen and the liquid-impervious backing element.

4,680,118

PLEATED AND SEALED FILTER CARTRIDGE WITH CONNECTED FILM

Jun Taga, Kawasaki, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan, a part interest

Filed Oct. 21, 1985, Ser. No. 789,572
Claims priority, application Japan, Oct. 19, 1984, 59-21834
Int. Cl.[4] B01D *27/06*
U.S. Cl. 210—493.1 **4 Claims**



1. A cartridge filter comprising:
a pleat-type porous membrane having a longer length than an effective filtering surface thereof;
a cylindrical body;
a lower plate;
a plurality of fins extending radially from a lower part of said upper cylindrical body and from said lower plate;
each of said plurality of fins being covered by said pleat-type porous membrane; and
said pleat-type porous membrane extending through said plurality of fins being folded and disposed along an outer circumference of said upper cylindrical body and fastenedingly sealed at one end, wherein a thin and flexible film is connected to said folded or sealed end portion of said porous membrane.

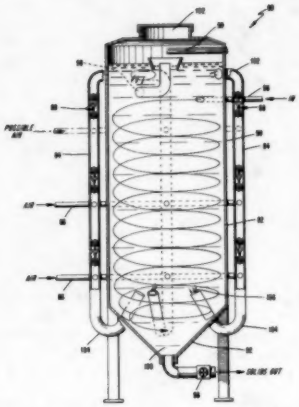
4,680,119

APPARATUS FOR INTRODUCING A GAS INTO A LIQUID

Grover C. Franklin, Jr., 2250 Warmouth St., San Pedro, Calif. 90732

Filed Apr. 10, 1985, Ser. No. 721,777
Int. Cl.[4] B01F *3/04*
U.S. Cl. 210—512.1 **2 Claims**

1. An apparatus for simultaneously separating solid particles from a liquid and aerating the liquid comprising:
a container having an upper cylindrical section and an inverted conical bottom portion, a valving means being provided at the apex of the conical section for removal of solid particles from the container, a tangential inlet and a central outlet being provided in the top section thereof,
at least one vertical conduit in fluid communication with the container, the conduit having an upper end connected tangentially to the top of the container and below the tangential inlet and central outlet, and a bottom portion which is bent upwards and penetrates the container near the bottom of the cylindrical section of the container, the



open end of the bottom portion being disposed near the center of the container, the conduit having disposed therein at least one mixer assembly, each assembly comprising a plurality of turbines, the turbines being free to rotate, spaced apart vertically and having different speeds or directions of rotation; and
means for introducing a gas into the conduit at a point below the mixer assembly.

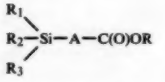
4,680,120

BONDED PHASE OF SILICA AND CARBOALKOXYALKYL SILANES FOR SOLID PHASE EXTRACTION

Hugh E. Ramsden, Scotch Plains, N.J., and Joseph M. Patterson, New Britain, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Division of Ser. No. 731,530, May 7, 1985, Pat. No. 4,640,909.
This application Sep. 8, 1986, Ser. No. 904,892
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **10 Claims**

1. In a solid phase extraction process for the cleanup and purification of 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid from a urine sample, the improvement comprising employing a solid phase bonded silica reaction product of silica and a carboalkoxyalkyl silane of the formula



in which R is an alkyl radical of from 1 to 3 carbon atoms, A is an alkylene group of from 2 to 4 carbon atoms and R_1, R_2 and R_3 are the same or different and are selected from the group consisting of halogen, an alkoxy group of from 1 to 6 carbon atoms, an alkoxyalkoxy group of from 2 to 5 carbon atoms and an alkyl group of from 1 to 3 carbon atoms, with the proviso that at least one of R_1, R_2 and R_3 is other than an alkyl group.

4,680,121
BONDED PHASE OF SILICA FOR SOLID PHASE EXTRACTION

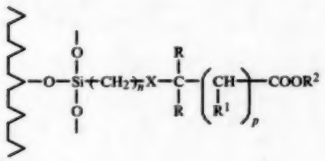
Hugh E. Ramsden, Scotch Plains, N.J., and Joseph M. Patterson, III, New Britain, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Division of Ser. No. 831,333, Feb. 20, 1986, Pat. No. 4,650,784. This application Aug. 4, 1986, Ser. No. 892,311

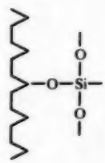
Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **13 Claims**

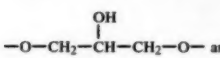
1. In a solid phase extraction process for the cleanup and concentration of 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid from a urine sample the improvement comprising employing a solid phase bonded silica product of the formula:



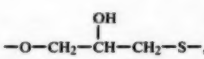
in which



is the backbone of a silica gel or controlled pore glass, X is selected from the group consisting of —O—, —S—,



and



each R and R^1 are each independently independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 3 carbon atoms and $—(CH_2)_mCOOR^3$, R^2 and R^3 are each independently an alkyl group of from 1 to 4 carbon atoms, n is an integer of from 2 to 5, p is zero or one and m is an integer of from 1 to 4, as the solid phase.

4,680,122
ULTRAFILTRATION CONTROL FOR HEMODIALYSIS

David Barone, Oklahoma City, Okla., assignor to Organon Teknika Corporation, Oklahoma City, Okla.

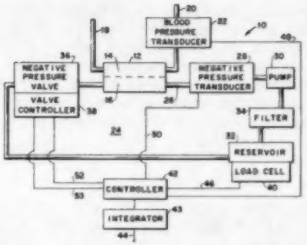
Filed Sep. 10, 1983, Ser. No. 534,034

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—637 **7 Claims**

1. A process for automatically controlling ultrafiltration in a closed dialysis system during hemodialysis comprising the steps of:

causing the flow of blood on one side of a semipermeable membrane, causing the flow of dialysate solution on the other side of said semipermeable membrane; collecting dialysate fluid and ultrafiltrate fluid in a reservoir; measuring the transmembrane pressure; indicating a desired ultrafiltration rate; measuring the total quantity of dialysate fluid and ultrafiltrate fluid in the reservoir at predetermined time intervals; comparing the actual quantity of fluid in the reservoir for each of said time intervals to the required quantity for the desired ultrafiltration rate; calculating the error between the required and the actual quantity of fluid in the reservoir; and adjusting the transmembrane pressure in response to the error for each of said time intervals.



4,680,123
REGENERATION OF SPENT DEVELOPERS

Ubbo Wernicke, Cologne; Heinz Meckl, Bergisch Gladbach; Hans-Günter Donner, Odenthal, and Jürgen Frosch, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,763

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437631

Int. Cl.[4] B01D *15/04*

U.S. Cl. 210—683 **4 Claims**

1. A process for the regeneration of spent photographic developers which comprises the step of treating a spent photographic developer with a strongly basic anion exchanger comprising OH-groups as exchangeable groups, sufficient to remove bromide and iodide ions from the spent photographic developer.

4,680,124
POLYACRYLATE SCALE INHIBITION

Paul R. Young, Wheaton; Mary E. Koutek, Westchester, and John A. Kelly, Crystal Lake, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 8, 1987, Ser. No. 1,928

Int. Cl.[4] C02F *5/14*

U.S. Cl. 210—697 **6 Claims**

1. The invention comprises a method of preventing the formation of calcium polyacrylate scale on industrial heat transfer surfaces which are in contact with water which contains a scale-forming species of calcium polyacrylate which comprises treating the water with a phosphorous compound from the group consisting of compounds capable of producing phosphate ions and water-soluble phosphonates with the amount of phosphorous compound being less than the amount of calcium polyacrylate.

4,680,125
METHOD OF INHIBITING THE DEPOSITION OF SCALE IN AN AQUEOUS SYSTEM

Dionisio G. Cuisia, Chicago, and Chih M. Hwa, Palatine, both of Ill., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 709,484, Mar. 7, 1985, Pat. No. 4,609,483. This application Jun. 6, 1986, Ser. No. 871,219

Int. Cl.[4] C02F *5/10*

U.S. Cl. 210—697 **25 Claims**

1. A method of inhibiting the deposition of scale in an aqueous system comprising the step of adding to or causing to be

present in the system water scale inhibiting amounts of a composition having a first component selected from carboxymethylcellulose and its water soluble salts within a molecular weight range of about 90,000 to about 500,000, and a second component consisting of at least one compound selected from gluconic acid, glucoheptonic acid and their water soluble salts; the ratio of the first component to the second component in said composition being between about 1:10 and about 10:1, such that the total resulting concentration of said first and second components in the system water achieves a reduction in scale deposit that is superior to the reduction in scale deposit achieved by an equivalent concentration of either component without the other.

4,680,126

SEPARATION AND RECOVERY OF REUSABLE HEAVY METAL HYDROXIDES FROM METAL FINISHING WASTEWATERS

James M. Frankard, 175 E. Lake Blvd., and Orville V. Broch, 101 E. Mark St., both of Winona, Minn. 55987

Filed Feb. 18, 1986, Ser. No. 830,532
Int. Cl.[4] C02F *1/62*
U.S. Cl. 210—710 **29 Claims**

1. A method for treating wastewaters and sludges from a plating process to facilitate reuse of metal values by the recovery of non-ferrous metal hydroxide, said method comprising the following steps (a) through (f) in the order presented:

(a) lowering the pH of an aqueous slurry obtained from a plating process from an alkaline pH to an acid pH, said slurry comprising solid ferrous hydroxide and a solid non-ferrous metal hydroxide wherein the non-ferrous metal is selected from the group consisting of zinc, nickel, copper (ii) cadmium, and chromium (III) to dissolve the non-ferrous metal hydroxide;

(b) converting the ferrous hydroxide to solid ferric hydroxide by aeration of the aqueous acidic slurry;

(c) isolating the solid ferric hydroxide from the slurry leaving a solution comprising non-ferrous metals;

(d) raising the pH of the solution of step (c) to precipitate non-ferrous metal hydroxide;

(e) recovering the precipitated non-ferrous metal hydroxide; and

(f) introducing said non-ferrous metal hydroxide into the plating process.

4,680,127

METHOD OF SCAVENGING HYDROGEN SULFIDE

James G. Edmondson, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 13, 1985, Ser. No. 808,590
Int. Cl.[4] C02F *1/00*
U.S. Cl. 210—749 **15 Claims**

1. A method for reducing the amount of hydrogen sulfide in a hydrogen sulfide-containing aqueous medium without solids formation, wherein said aqueous medium has a pH from neutral to alkaline, which method comprises adding to the aqueous medium an effective amount for the purpose of a glyoxal.

4,680,128

ANIONIC COPOLYMERS FOR IMPROVED CONTROL OF DRILLING FLUID RHEOLOGY

Robert C. Portnoy, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 26, 1985, Ser. No. 727,454
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.511 **3 Claims**

1. An aqueous drilling fluid comprising a water base, calcium ions a clayey material suspended in said water base, calcium ions and from about 0.25 pounds per barrel (ppb) to about 8 ppb based on the total volume of said fluid of a copolymer consisting essentially of acrylic acid and alkali metal vinylsulfonate salt and having a molecular weight (Mw) of from 2,000 to 10,000, wherein the monomer mole ratio of the acrylic acid to sulfonate in the copolymer is 1:1 to 19:1.

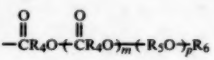
4,680,129

MODIFIED SUCCINIMIDES (X)

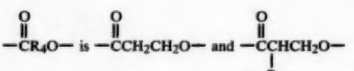
Frank Plavac, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1986, Ser. No. 820,188
Int. Cl.[4] C10M *133/16*
U.S. Cl. 252—51.5 A **16 Claims**

1. A polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with:



wherein R_4 is alkylene of from 1 to 6 carbon atoms excluding R_4 groups wherein



wherein R_{11} is the remainder of the R_4 group; m is an integer of from 0 to 2; R_5 is alkylene of from 2 to 5 carbon atoms; p is an integer of from 1 to 100; R_6 is selected from the group consisting of hydrogen and hydrocarbyl of from 1 to 30 carbon atoms; and with the proviso that if m is one or two then R_6 is hydrogen.

13. A lubricating oil composition comprising an oil of lubricating viscosity and a dispersant effective amount of a compound as defined in claim **1**.

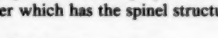
4,680,130

PREPARATION OF FINELY DIVIDED ISOTROPIC FERRITE POWDERS HAVING THE SPINEL STRUCTURE

Hartmut Hibst, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 26, 1985, Ser. No. 780,458
Int. Cl.[4] C04B *35/26*
U.S. Cl. 252—62.60 **4 Claims**

1. A process for the preparation of a finely divided ferrite powder which has the spinel structure, is of the formula



where M is Mg, Mn, Co, Ni, Cu and/or Zn and x is from 0 to 1, and has an essentially isotropic particle shape, wherein an oxygen-containing gas is passed into a coprecipitate prepared from an aqueous alkali metal hydroxide solution, an M(II) salt solution, an iron(II) salt solution and an iron(III) salt solution, the ratio of the iron(III) ions to the sum of the M(II) and Fe(II) ions in the coprecipitate being smaller than that in the resulting ferrite powder of the composition $M_xFe_{3-x}O_4$.

4,680,131

DETERGENT COMPOSITIONS

Alfred Busch, Grimbergen, and James C. T. B. St. Laurent, Overijse, both of Belgium, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 598,652, Apr. 10, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,414

Claims priority, application United Kingdom, Apr. 20, 1983, 8310698

Int. Cl.[4] C11D 7/54

U.S. Cl. 252—102 5 Claims

1. A laundry detergent composition comprising:

(a) from about 2% to about 60% of organic surfactant selected from the group consisting of anionic, nonionic, cationic, ampholytic and zwitterionic surfactants of the mixture thereof;

(b) from about 1% to about 20% of smectite-type clay selected from the group consisting of saponites, hectorites and sodium and calcium montmorillonites and mixtures thereof,

(c) from about 0.005 to about 0.02 mmoles % of copper precomplexed with aminopolycarboxylate sequestrant having a logarithmic copper stability constant of at least about 11, said aminopolycarboxylate sequestrant being selected from the group consisting of ethylenediaminetetraacetric acid, diethylenetriaminepentaacetic acid, hydroxyethylethylenediaminediacetic acid, nitrilotriacetic acid, mixtures thereof and water-soluble salts, thereof, and

(d) from about 0.5% to about 50% of perborate bleaching agent.

4,680,132

PROCESSING DETERGENT BARS WITH A CAVITY TRANSFER MIXER TO REDUCE GRITTINESS

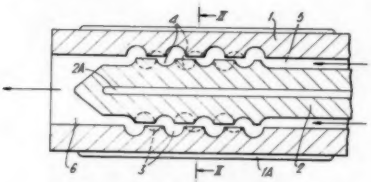
Terence A. Clarke; Richard B. Edwards, and Graeme N. Irving, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 587,874, Mar. 14, 1984, abandoned, which is a continuation of Ser. No. 479,625, Mar. 28, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,457

Claims priority, application United Kingdom, Mar. 29, 1982, 8209051

Int. Cl.[4] B01F 7/02; B29B 1/06; C11D 13/10, 13/18

U.S. Cl. 252—108 6 Claims



1. A process of reducing the grittiness in a soap-containing feedstock wherein the feedstock is subjected to working by passing said feedstock between two closely spaced mutually displaceable surfaces each having a pattern of cavities which overlap during movement of the surfaces so that the material moved between the surfaces traces a path through cavities alternately in each surface, whereby the bulk of the material passes through the shear zone generated in the material by displacement of the surfaces.

4,680,133

STRIPPING COMPOSITION CONTAINING AN AMIDE AND A CARBONATE AND USE THEREOF

Irl E. Ward, Easton, Pa., assignor to Environmental Management Associates, Inc., Macungie, Pa.

Filed Mar. 26, 1986, Ser. No. 844,385

Int. Cl.[4] C09D 9/00; C11D 7/32, 7/50, 7/52

U.S. Cl. 252—153 22 Claims

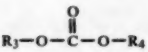
1. A stripping composition comprising a mixture of:

(a) from about 25% to about 90% by weight of an amide compound of the formula:

(Formula I)

and mixtures thereof, wherein R is selected from the group consisting of hydrogen, methyl, ethyl, propyl and phenyl; R_1 and R_2 are selected from the group consisting of hydrogen and methyl; and

(b) from about 10% to about 75% by weight a carbonate compound of the formula:



(Formula II)

and mixtures thereof, wherein R_3 and R_4 are selected from the group consisting of methyl or ethyl or R_3 and R_4 together form a divalent ethylene, propylene or butylene group of a cyclic carbonate.

7. A stripping composition of claim 1 wherein the amide component is selected from the group consisting of dimethyl acetamide and dimethyl formamide and the carbonate component is selected from the group consisting of propylene carbonate and ethylene carbonate.

4,680,134

METHOD FOR FORMING SOLID DETERGENT COMPOSITIONS

Bernard J. Heile, Apple Valley, and Terry J. Klos, Minnetonka, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 663,473, Oct. 18, 1984, Pat. No. 4,595,520. This application Mar. 17, 1986, Ser. No. 840,455

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] C11D 7/56

U.S. Cl. 252—160 10 Claims

1. A detergent composition comprising:

(a) about 5–25% of an alkali metal hydroxide;

(b) a condensed phosphate hardness sequestering agent; and

(c) an amount of a solidifying agent selected from the group consisting of hydrated sodium carbonate, hydrated sodium sulfate and mixtures thereof, which is effective to harden the detergent composition into a uniform solid.

4,680,135

CARBOXYLIC/SULFONIC POLYMER AND CARBOXYLIC/POLYALKYLENE OXIDE POLYMER ADMIXTURES FOR USE IN IRON OXIDE DEPOSIT CONTROL

Charles Y. Cha, McMurray, and Richard G. Varsanik, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 669,902, Nov. 9, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 819,094

Int. Cl.[4] C02F 5/10

U.S. Cl. 252—180 1 Claim

1. A process for inhibiting formation and deposition of iron oxide in an aqueous system containing calcium ions, compris-

ing adding to said system 0.1 to 25 ppm of an admixture comprising:

(A) a water-soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g, prepared from:

(i) 50 to 70%, by weight, of an unsaturated carboxylic acid, or its salt; and

(ii) 30 to 50%, by weight, of an unsaturated sulfonic acid, or its salt; and

(B) a water-solubel polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g prepared from:

(i) 50 to 70%, by weight, of an unsaturated carboxylic acid or its salt; and

(ii) 30 to 50%, by weight, of an unsaturated pendant polyalkylene oxide compound; wherein the ratio of (A):(B) is about 1:1, wherein said unsaturated carboxylic acid of (A) or (B) is selected from the group consisting of acrylic acid and methacrylic acid, wherein said unsaturated sulfonic acid is selected from the group consisting of 2-acrylamido-2-methylpropyl sulfonic acid and 2-methacrylamido-2-methylpropyl sulfonic acid, and wherein said unsaturated pendant polyalkylene oxide compound is methoxyallyl polyethylene glycol of the formula:

$$CH_2{=}CH{-}CH_2(OCH_2CH)_nOCH_3,$$

wherein n ranges from 5–10.

4,680,136

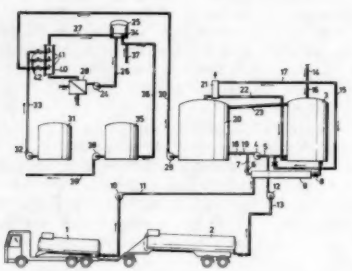
METHOD FOR PREPARING COMPOSITIONS WHICH CAN BE USED IN THE PRODUCTION OF SODIUM DITHIONITE; AND THE USE OF SUCH COMPOSITIONS

Ragnar Bernhard, Falun, Sweden, assignor to Stora Kopparbergs Bergslags AB, Falun, Sweden

Filed May 7, 1985, Ser. No. 731,296

Int. Cl.[4] C01B *17/66;* **C01D** *5/14;* **C09K** *3/00*

U.S. Cl. 252—188.2 **5 Claims**



1. A method for preparing compositions capable of being used in the preparation of sodium dithionite by means of a continuous process using a reducing agent comprising an aqueous solution of sodium borohydride and sodium hydroxide, which method comprises bringing sulphur dioxide into contact with a recirculating aqueous solution of sodium hydroxide and previously absorbed sulphur dioxide to a ratio between sulphur dioxide and the sum of sulphur dioxide and sodium oxide of 0.61–0.66, pressurizing the resultant mixture and introducing liquid sulphur dioxide thereinto to achieve a ratio between sulphur dioxide and the sum of sulphur dioxide and sodium oxide of 0.75–0.81, and adjusting the water content to a concentration of SO_2+Na_2O of 10–13 percent by weight.

4,680,137

LIQUID CRYSTAL ESTER COMPOUND

Toyoshiro Isoyama; Tetsuya Ogawa, both of Yokohama, and Shigeru Sugimori, Musashino, all of Japan, assignors to Chisso Corporation, Japan

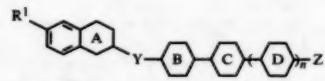
Filed Jun. 2, 1986, Ser. No. 869,682

Claims priority, application Japan, Jun. 10, 1985, 60-125490; Jun. 25, 1985, 60-138783

Int. Cl.[4] C09K *19/32;* **C07C** *69/76, 69/74;* **G02F** *1/13*

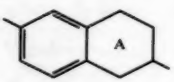
U.S. Cl. 252—299.62 **9 Claims**

1. A liquid crystal ester compound expressed by the formula

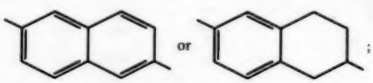


(I)

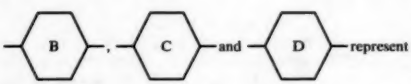
wherein R^1 represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms;

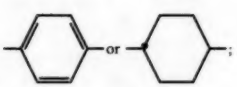


represents



Y represents —COO— or —OCO—; any of





in represents 0 or 1; and Z represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms, or a halogen atom of F, Cl or Br.

4,680,138

SILVER SENSING MATERIAL FOR USE ON FILM

Delbert E. Sayles, Sr., 3814 N. 88th St., Omaha, Nebr.

Filed Oct. 22, 1985, Ser. No. 790,247

Int. Cl.[4] H01B *1/04, 1/02*

U.S. Cl. 252—503 **7 Claims**

1. In a paint composition comprising a conductive metal, selected from the group consisting of silver, gold and aluminum, suspended in Butyl Acetate as a liquid vehicle, the improvement comprising approximately 23.9% by weight of Toluene in the liquid vehicle, the conductive metal being 20 to 30% by weight of the composition.

4,680,139

ELECTROSTATICALLY CONDUCTIVE PREMOLD COATING

Charles F. Williams, Brunswick, and Atam P. Sahni, Solon, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 720,992, Apr. 8, 1985, Pat. No. 4,587,160, which is a continuation-in-part of Ser. No. 503,861, Jun. 13, 1983, abandoned. This application May 2, 1985, Ser. No. 728,084

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 7 Claims

1. A powdered electroconductive coating composition having a particle size of at least 100 mesh adaptable to be applied and cured to a final, finish coating over a compatible synthetic resinous substrate and chemically bonded thereto, the powdered composition comprising a partially cured, thermosetting synthetic resin having graphite dispersed throughout each particle, wherein the graphite is in the form of flake having a particle size of about 5 to 80 microns, or a mixture of said graphite flake and graphite fiber and is present in sufficient quantity to render said cured coating electroconductive.

4,680,140

METAL POWDER-CONTAINING COMPOSITIONS

Yoshiteru Kageyama, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,789

Claims priority, application Japan, Jan. 31, 1985, 60-17216; Jan. 31, 1985, 60-17217

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 14 Claims

1. A metal powder-containing polymer composition consisting essentially of:

(a) powder of a metal having an amino compound or a mixture of an amino compound and a silane coupling agent compound thereon, the mean particle size of the metal powder being in the range of 0.01 to 100 microns, and

(b) a thermoplastic resin comprising a carboxyl group-containing thermoplastic resin, the carboxyl group content of the carboxyl group-containing thermoplastic resin being 0.01 to 15% by weight of the resin.

4,680,141

SOLDER COMPOSITION

Felix Barajas, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 29, 1984, Ser. No. 676,199

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 11 Claims

1. A solder composition which comprises a liquid vehicle, said liquid vehicle containing a viscosity controlling agent and a flux, finely divided solder metal dispersed in said vehicle, said solder metal having a particle size ranging from 40 to 70 microns, said liquid vehicle being present in an amount of 10 to 14%, and said solder metal being present in an amount of 86 to 90%, by weight of total vehicle and solder metal in said composition, and additional metal particles dispersed in said vehicle, said additional particles being in the form of metal balls or flakes selected from the group consisting of brass, bronze and copper, said additional metal particles having a size ranging from about 5 to about 30 mils and being present in an amount ranging from about 5 to about 60% by weight of the total composition.

4,680,142

PROCESS FOR PREPARING 4,4A,5,6-TETRAHYDRO-7-METHYL-2-(3H)-NAPHTHALENONE, INTERMEDIATES USED IN SAID PROCESS AND NOVEL CRYSTALLINE FORM OF SAME

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Myrna L. Hagedorn, Edison, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

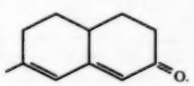
Division of Ser. No. 368,640, Apr. 15, 1982, which is a continuation-in-part of Ser. No. 354,111, Mar. 2, 1982, abandoned. This application Oct. 17, 1986, Ser. No. 920,225

Int. Cl.[4] C11B *9/0*; A61K *7/46*

U.S. Cl. 252—522 R 7 Claims

GLC PROFILE FOR EXAMPLE I CRUDE

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of 4,4A,5,6-tetrahydro-7-methyl-2-(3H)-naphthalenone having the structure:



4,680,143

DETERGENT COMPOSITIONS

David J. Edge, Chester; Appaya R. Naik, Merseyside, and Melvin Scott, Cheshire, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 551,457, Nov. 14, 1983, abandoned. This application Jun. 25, 1985, Ser. No. 748,150

Claims priority, application United Kingdom, Nov. 16, 1982, 8232643

Int. Cl.[4] C11D *1/83*

U.S. Cl. 252—553 9 Claims

1. A foaming liquid detergent composition in the form of a stable aqueous solution containing from 16 to 40% by weight of an active detergent mixture comprising

(a) a water-soluble salt of a dialkyl ester of sulphosuccinic acid in which the alkyl groups may be the same or different, in an amount of at least 2% by weight based on the total composition,

(b) a C_9–C_{15} alkylbenzene sulphonate, and

(c) a C_{10}–C_{18} alkyl ether sulphate, wherein the weight ratio of (a) to (b) is from 4:1 to 0.1:1 and the weight ratio of (a)+(b) to (c) is from 2.5:1 to 1:1.

4,680,144

BENZENE SULFONATE QUATERNARY AMMONIUM SALTS OF ORGANIC SUNSCREEN CARBOXYLIC ACIDS

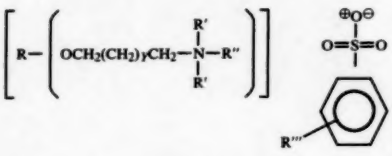
Donald E. Conner, Clifton, N.J., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 623,206, Jun. 21, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 924,340

Int. Cl.[4] C07C 87/68, 95/08; A61K 7/06; A01K 7/42

U.S. Cl. 260—501.15 4 Claims

1. As a novel composition of matter, a benzene sulfonate quaternary salt of an organic sunscreen carboxylic acid corresponding to the formula:



wherein the R is an acyl derived from the group consisting of p-amino benzoyl, p-dimethyl amino benzoyl, p-methoxy cinnamoyl, p-methoxy benzal, and cinnamal malonoyl; R′ is an alkyl group having from 1 to 2 carbon atoms; R″ is an alkyl group having from 10 to 20 carbon atoms; R‴ is selected from the group consisting of H and CH_3; and Y is an integer of 0 to 1.

4,680,145

PROCESS FOR PRODUCING DIPEROXOIC ACIDS

Keith M. Taylor, Ballwin; Liou-Liang Horng, Clayton, and Timothy K. Hirzel, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 646,720, Sep. 4, 1984. This application Aug. 1, 1986, Ser. No. 891,825

Int. Cl.[4] C07C 178/00

U.S. Cl. 260—502 R 12 Claims

1. A process for making alkyl or phenyl substituted-butane diperoxoic acid which comprises reacting hydrogen peroxide with alkyl or phenyl substituted succinic anhydride in a strong acid reaction medium and in the presence of a water immiscible reaction modifier in the range from about 0.25 ml. to about 2 ml. of said modifier per gram of said anhydride, said amount of modifier being sufficient to prevent a gelled reaction mass and substantially less than required to dissolve the alkyl or phenyl substituted-butane diperoxoic acid.

4,680,146

PROCESS FOR THE PREPARATION OF 4,4′-DINITROSTILBENE-2,2′-DISULPHONIC ACID SALTS

Guido Skipka, Stolberg, and Friedrich Dürholz, Remscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,486

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519552

Int. Cl.[4] C07C 143/24

U.S. Cl. 260—505 R 16 Claims

1. A process for the preparation of 4,4′-dinitrostilbene-2,2,-disulphonic acid salts comprising oxidizing nitrotoluene-2-sulphonic acid or salts thereof in an aqueous alkaline medium, adding potassium, calcium and/or magnesium ions during the process at the same rate at which the 4,4′-dinitrostilbene-2,2′-disulphonic acid is formed, the amount of added potassium, calcium and/or magnesium ions being 10 to 150 mol % at any particular time during the process, relative to the amount of 4,4′-dinitrostilbene-2,2′-disulphonic acid present in the reaction mixture at that particular time, and removing the precipitated salt of 4,4′-dinitrostilbene-2,2′disulphonic acid.

4,680,147

PROCESS FOR THE ISOLATION UNDER MILD CONDITIONS OF PARAFFINSULFONATE AND SULFURIC ACID FROM REACTION MIXTURES FROM PARAFFIN SULFOXIDATION

Rudolf Pistorius, Hünstetten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 629,994, Jul. 12, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 804,312

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325516

Int. Cl.[4] C07C 143/02

U.S. Cl. 260—513 R 5 Claims

1. A process for the isolation under mild conditions of paraffinsulfonate from the aqueous reaction mixtures which result from the sulfoxidation of n-paraffins, from which sulfur dioxide has been removed by degassing, and which contain higher molecular weight sulfonic acids, sulfuric acid, n-paraffins and water, which process comprises allowing at least one aliphatic alcohol having 2 to 8 carbon atoms and at least one less-polar solvent to act on such reaction mixtures at the same time, removing the aqueous phase which has separated out and contains sulfuric acid, and neutralizing the product phase containing paraffinsulfonates, evaporating it and driving out the remaining paraffin using superheated steam; said less polar solvents being carbon tetrachloride, chloroform, 1,2-dichloroethane, 1,1,2-trichloro-trifluoroethane, or methylene chloride.

4,680,148

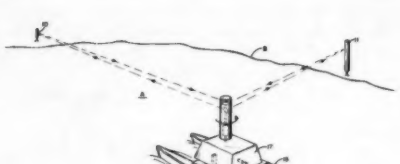
MOBILE POND AERATING SYSTEM

Dominic S. Arbisi, Minnetonka, and Coy E. Replogle, Minneapolis, both of Minn., assignors to Aeras Water Resources, Inc., Eden Prairie, Minn.

Filed May 30, 1985, Ser. No. 739,291

Int. Cl.[4] B01F 3/04

U.S. Cl. 261—120 3 Claims



1. An aerating system for aerating substantially all areas of a pond of water surrounded by a bordering shoreline, said system comprising:

a self-propelled flotation unit,

a subsurface aerating discharge nozzle mounted on said unit for discharging aeration gas into the water below the surface thereof,

programmed means mounted on board the unit free from any connection with the shoreline for guiding and propelling the flotation on the water surface in a substantially predetermined path so that the aerating discharge for the nozzle effectively distributes the aerating gas to substantially all areas of the pond with complete freedom of controlled movement without restraints connected to the shoreline,

said electronic control system comprising a sending, computing and automatic control of the direction and speed of the unit and which includes a laser beam timed transmit-

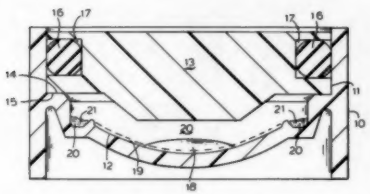
ting device also mounted on the flotation unit combined with a plurality of reflecting mirrors mounted in fixed relation to the shore line of the pond to produce a flotation unit orienting signal, means on board the unit for sensing the orienting signal to determine the angular position of the flotation unit, said electronic control system automatically varying the direction of travel of said unit to be controlled in accordance with the sensed position of the unit.

4,680,149

MOLD AND METHOD FOR SPIN CASTING A PRECISELY CONFIGURED ARTICLE

David L. Rawlings, Bayville; Robert E. Glick, Huntington Station, both of N.Y., and Robert Chang, Philadelphia, Pa., assignors to International Hydron Corporation, Woodbury, N.Y.

Filed May 19, 1986, Ser. No. 865,217
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—2.1 **15 Claims**



1. In a mold for spin casting a precisely configured article which possesses at least one precisely configured surface for spin casting the article from an initially liquid polymerization reaction mixture containing at least one substance which is volatile under spin casting conditions and means for sealing the mold cavity against any appreciable loss of said volatile substance from beyond the open space lying between the upper surface of the liquid polymerization reaction mixture and the lower surface of said sealing means, the improvement which comprises a reservoir which is separate from said precisely configured surface and which communicates with said open space, said reservoir being adapted to receive a quantity of liquid volatile substance such that during spin casting, volatilized substance from the contents of the reservoir will be present in the open space reducing the loss of volatile substance from the polymerization reaction mixture.

6. A method of spin casting a precisely configured article which comprises:

(a) spinning a mold containing a predetermined quantity of a liquid polymerizable material containing at least one component which is volatile under spin casting conditions, said spinning being carried out about the vertical axis of the mold and at a speed which is sufficient to cause the liquid polymerizable material contained in the mold to be radially outwardly displaced and to thereby assume a predetermined geometric configuration, said mold being provided with gas-tight sealing means to prevent appreciable loss of volatile component during spinning, there being a volume of open space defined between the upper surface of the liquid polymerizable mixture and the lower surface of the sealing means, said mold being further provided with a reservoir containing a quantity of liquid volatile substance such that during said spinning of the mold, volatilized substance from the contents of the reservoir will be present in the open space reducing the loss of volatile substance from the liquid polymerization reaction mixture to said open space; and,

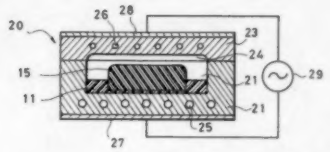
(b) causing the liquid polymerizable material in the spinning mold to undergo polymerization thereby providing a shape-retaining, precisely configured solid polymeric article.

4,680,150

METHOD FOR MANUFACTURING FOAMED PLASTICS

Hiromichi Matsuda, Nagoya, Japan, assignor to Inoue MTP Kabushiki Kaisha, Aichi, Japan

Filed Jul. 30, 1985, Ser. No. 760,806
Claims priority, application Japan, Jan. 31, 1985, 60-18418
Int. Cl.[4] B29C *67/22, 65/30*
U.S. Cl. 264—26 **9 Claims**



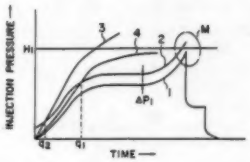
1. A method for manufacturing molded plastics having a predetermined shape by heating a plastic raw material which is located in molding dies having electrodes by applying high frequency voltage to the electrodes to melt and plasticize the plastic raw material, so that a foaming agent contained in the plastic material dissolves, wherein said method comprises; introducing a flowable shell forming material in the molding dies and introducing a core forming material having a foaming agent mixed therein in or on the shell forming material so that the core forming material is upstanding in the molding dies, said core forming material having a hardness which is sufficient to maintain its original shape when it is located in or on the shell forming material; clamping the molding dies together; and initially heating the shell forming material and subsequently the core forming material by the application of high frequency voltage thereto until the core forming material foams, enlarges in size and forces the shell forming material to flow in the mold cavity and surround the foamed core to form a molded composite foamed resin article.

4,680,151

INJECTION PRESSURE MONITORING METHOD AND APPARATUS

Shigeru Fujita, Numazu; Hideo Banzai, Mishima, and Hideo Tanaka, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 592,016, Mar. 21, 1984, Pat. No. 4,585,931.
This application Feb. 12, 1986, Ser. No. 828,684
Claims priority, application Japan, Mar. 23, 1983, 58-48450
Int. Cl.[4] B29C *47/92*
U.S. Cl. 264—40.3 **3 Claims**



1. A method of monitoring data regarding continuously varying injection pressure in an injection process of an injection molding machine comprising the steps of: detecting data regarding the injection pressure as a variable of time using multipoint sampling for one injection operation cycle of said machine, storing detected data of said one injection operation cycle as reference data, detecting data regarding the injection pressure as a variable of time using multipoint sampling for another injection operation cycle of said machine, comparing said stored reference data with said detected data regarding the

injection pressure in said another injection operation cycle, and generating an alarm information when a deviation between said detected data for said another operation cycle and said reference data exceeds a predetermined limit.

4,680,152

METHOD FOR MONITORING DEVIATIONS IN THE DIMENSIONS OF A CONTINUOUSLY EXTRUDED PROFILE STRIP

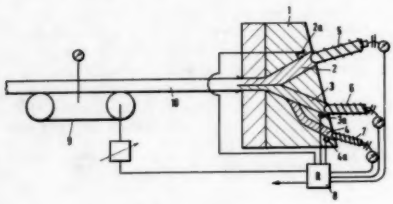
Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,231

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434903

Int. Cl.[4] B29C *47/92*

U.S. Cl. 264—40.4 **1 Claim**



1. A method of monitoring deviations in the weight per unit length of a profiled strip formed by feeding a plurality of separately extruded mixtures into a common profile strip extruding nozzle in which said separate mixtures are combined to form said strip, comprising the steps of:

(a) measuring the extrusion pressure and temperature of each mixture after being separately extruded and before the strip is extruded by the strip extruding nozzle,

(b) providing and storing in a control device the desired pressure and temperature values of each mixture, the desired weight per unit length value of the profile strip, and the desired percentages of mixtures comprising the strip,

(c) simultaneously feeding each mixture to the strip extruding nozzle to produce an extruded profile strip comprised of said mixtures,

(d) continuously weighing the extruded profile strip to determine the weight per unit length of the profile strip,

(e) comparing the actually determined weight per unit length of the strip with the stored desired weight per unit length, and determining the variation,

(f) comparing the actually measured pressure and temperatures of each mixture with the corresponding control value for each such mixture, and determining the variation, and

(g) adjusting the feed rate of one or more of said mixtures where deviations exist,

whereby the desired percentages of mixtures is reestablished and the measured weight per unit length of the strip is made equal to the desired weight per unit length of the strip.

4,680,153

PROCESS FOR MANUFACTURING HIGHLY POROUS MINERALIC BODIES OF POLYMORPHIC STRUCTURE

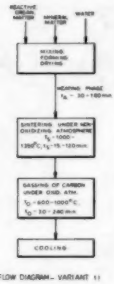
Reiner Kinder, Leipzig; Johannes Teubel, Freiberg; Herbert Schuster, and Christine Fanslau, both of Leipzig, all of German Democratic Rep., assignors to Institut for Energetik - Zentralstelle fur Rationelle Energieanwendung, Leipzip, German Democratic Rep.

Filed May 29, 1984, Ser. No. 614,920

Claims priority, application German Democratic Rep., May 27, 1983, 251337

Int. Cl.[4] B28B *1/50*

U.S. Cl. 264—44 **12 Claims**



1. A process for manufacturing highly porous mineralic bodies for use as adsorbents with heterogeneous pore structure which can be subjected to temperatures in excess of 1000° C. and can be regenerated many times, comprising the steps of:

(a) producing a mixture consisting predominantly of mineralic matter including fly ash and alkaline-earth compounds with reactive organic admixtures up to 15% in terms of the carbon content by weight of the mineralic matter;

(b) heating said mixture in a nonoxidizing atmosphere to a sintering temperature of said mineralic matter between 1000° C. and 1350° C. for 30 to 180 minutes;

(c) maintaining said mixture at said sintering temperature in said nonoxidizing atmosphere for a period of 15 to 120 minutes and long enough to enable consolidation of said mineralic matter into a coherent structure interpenetrated by carbonized organic matter; and

(d) exposing said structure to an oxidizing atmosphere at a reduced temperature for 30 to 240 minutes of 600° C. to 1000° C. and high enough to burn off and gasify the carbonized matter with a resulting increase of the porosity of said structure so that the pore configuration thereof is heterogeneous.

4,680,154

METHOD OF MAKING CERAMIC ARTICLES

Saburo Matsubara, Yokohama, and Shinichi Yagi, Kawasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

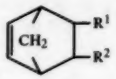
Filed Apr. 3, 1985, Ser. No. 719,344

Claims priority, application Japan, Apr. 14, 1984, 59-73931

Int. Cl.[4] C04B *35/64*

U.S. Cl. 264—63 **6 Claims**

1. A method of making ceramic articles which comprises the steps of shaping a composition for the manufacture of ceramics and firing the resulting shaped green body, characterized in that the composition for the manufacture of ceramics contains (a) 100 parts by weight of ceramic powder; (b) 0.2 to 20 parts by weight of an organic binder comprising one or more members selected from the group consisting of ring-opening homopolymers and copolymers derived from (1) bycyclo[2.2.1]heptene-2 and its derivatives, which are represented by the formula



(I)

where R^1 is —H, —CH_3, —CO_2CH_3 or —$OCOCH_3$, R^2 is —H or —$OCOCH_3$, and R is —$OCOCH_3$ when R^2 is —$OCOCH_3$, and (2) dicyclopentadiene; and 0.1 to 300 parts by weight of (c) a plasticizer and/or (d) a hydrocarbon solvent.

4,680,155

METHOD OF PRODUCING SHAPED ARTICLES HAVING A SIMULATED MARBLE APPEARANCE

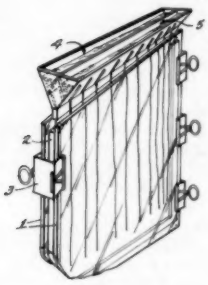
Malcolm P. Rochefort, Darwen, and Richard Wood, Blackburn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 22, 1985, Ser. No. 725,812

Claims priority, application United Kingdom, May 9, 1984, 8411824

Int. Cl.⁴ B29C *39/12*

U.S. Cl. 264—73 **9 Claims**



1. A method of forming a shaped article having the appearance of simulated marble wherein polymerisable materials are polymerised within the cavity of a mould or cell characterized in that the mould is filled with a stream of a fluid polymerisable composition comprising at least two compositions of different colors wherein the at least two compositions are caused to flow into the mould or cell in contacting streams as a pattern of lines following the flow path of the compositions into the mould and the polymerisation process is conducted with the mould or cell disposed so that the flow lines are on a height gradient relative to each other, whereby limited mixing of the composition takes place by thermal convection currents during the polymerisation whilst the polymerisable compositions are sufficiently fluid.

4,680,156

SHEATH CORE COMPOSITE EXTRUSION AND A METHOD OF MAKING IT BY MELT TRANSFORMATION COEXTRUSION

John R. Collier, Athens, Ohio, assignor to Ohio University, Athens, Ohio

Filed Oct. 11, 1985, Ser. No. 786,441

Int. Cl.⁴ B29C *47/86*

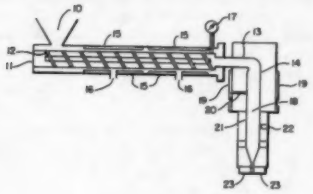
U.S. Cl. 264—171 **5 Claims**

1. A method of making a composite extrusion having an inner core and an outer sheath which comprises

causing said inner core-forming material to assume a molecular orientation coaxial to the longitudinal axis of said core while said core-forming material is in a molten state and in a confined space,

surrounding said core-forming material with a liquid sheath-forming material while in said confined space,

withdrawing said molecularly-oriented core-forming material while surrounded by said sheath-forming material from said confined space through a reducing die having a temperature gradient between said confined space and the exit from said die of an amount such that crystallization of



at least the outer skin of said formed core will occur prior to said extrusion leaving said die but such that said sheath-forming material will not crystallize until said extrusion exits said die.

4,680,157

METHOD FOR THE PREPARATION OF A CRYSTALLINE THERMOPLASTIC RESIN SHEET

Atsushi Fujii, Kisarazu; Kazuhisa Kaneda, and Yoshihiro Tokiya, both of Ichihara, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,076

Claims priority, application Japan, Jul. 25, 1984, 59-153206; Jul. 27, 1984, 59-155520

Int. Cl.⁴ B29C *47/88*

U.S. Cl. 264—180 **8 Claims**

1. A method for the preparation of a crystalline polypropylene-based resin sheet having excellent transparency which comprises:

(a) extruding a molten crystalline thermoplastic resin into a sheet;

(b) quenching the extruded resin sheet by passing said resin sheet through a slit where cooling water is flowing in contact with said resin sheet and in the same direction thereby quenching said resin sheet, said cooling water flowing through said slit at a higher velocity than the velocity of said resin sheet through said slit to provide a quenched resin sheet; and

(c) heating said quenched resin sheet at a temperature from 10° to 60° below the melting point of said resin to heat treat said quenched resin sheet;

(d) stretching said quenched and heat treated resin sheet at a temperature of from 5° to 70° lower than the melting point of the resin, the stretch ratio being from 1.02 to 1.2 times.

4,680,158

CIRCULAR PELLETIZING MACHINE AND METHOD OF CONTROLLING THE SAME

Jürgen Hinzpeter, and Ingo Schmidt, both of Schwarzenbek, Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,313

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520203

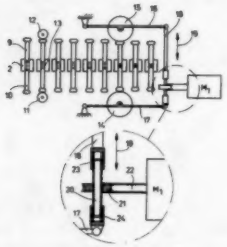
Int. Cl.⁴ B29B *9/00*

U.S. Cl. 264—40.5 **7 Claims**

1. A circular pelletizing machine for compressing of powder or grain materials, comprising a rotatable matrix disc with a plurality of circumferentially distributed matrices; upper and lower punches located above and below said matrix disc respectively; at least two pre-pressing elements movable relative to one another and acting upon said upper and lower stamps so as to pre-press pellets of a material; at least two main pressing elements movable relative to one another and acting upon said

upper and lower stamps so as to finally press the pellets of the material; an adjusting motor arranged to adjust a distance between said main pressing elements relative to one another; computer means arranged to control said adjusting motor; and means for measuring a pressing force of said pre-pressing elements and supplying data of the measurement to said computer means so that said computer means controls said adjusting motor and therefore the distance between said main pressing elements in dependence upon the measured pressing force of said pre-pressing elements to avoid application of a pressing force by the main pressing elements above a predetermined limit.

4. A method of controlling a circular pelletizing machine in



which the material to be pressed is accommodated in matrices of a matrix disc, pre-pressed by upper and lower stamps under the action of pre-pressing elements, and then finally pressed by the upper and lower stamps under the action of main pressing elements, the method comprising the steps of adjusting a distance between the main pressing elements by an adjusting motor which is controlled by computer means; measuring a pressing force on the pre-pressing elements; and supplying data of the measurement to the computer means so that the computer means control the adjusting motor and thereby the distance between the main pressing elements in dependence upon the measured pressing force of the pre-pressing elements to avoid application of a pressing force by the main pressing elements above a predetermined limit.

4,680,159

STORAGE CONTAINER ASSEMBLY FOR ACCOMMODATING INDIVIDUAL FUEL RODS OF IRRADIATED NUCLEAR REACTOR FUEL ELEMENTS

Helfrid Lahr, Karlsdorf, and Bernd Pontani, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,182

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430243

Int. Cl.[4] G21F 5/00

U.S. Cl. 376—272 **8 Claims**

1. A nuclear waste storage container assembly for storing radioactively-contaminated structural pieces and fuel rods of disassembled irradiated nuclear reactor fuel elements, the fuel rods giving off decay heat and the structural pieces giving off a decay heat less than the fuel rods, the storage container assembly comprising:

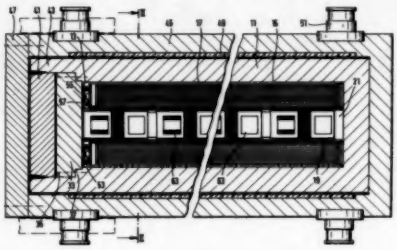
a vessel defining a longitudinal axis and having a base wall and a cylindrical side wall extending upwardly from said base wall to conjointly define a storage space of circular cross section extending in the direction of said axis, said vessel further having an opening at one longitudinal end thereof communicating with said storage space;

a plurality of elongated cans for storing said fuel rods therein, each of said cans having a circular-segmented cross section with one curved wall defining a curved wall surface having a radius of curvature corresponding to the radius of curvature of said cylindrical side wall;

holding means for holding said plurality of cans and including structure defining a shaft-like enclosure extending in the direction of said axis for storing said structural pieces;

said holding means being adapted for insertion into said storage space so as to cause said cans to be disposed radially of and in surrounding relationship to said axis;

said holding means being configured to hold said cans in a circle-like arrangement one adjacent the other with the respective curved wall surfaces of all of said cans being in flush direct contact engagement with the cylindrical inner wall surface of said side wall so as to permit the direct



transfer of said decay heat from all of said cans through said curved wall surfaces thereof directly to said vessel;

each of said cans having respective mutually adjacent radial walls extending from said curved wall thereof which are limited in radial direction so as to permit said cans to be accommodated in said holding means in surrounding relationship to said enclosure;

cover means for closing off said opening of said vessel; and,

hold-down resilient means for holding said cans in position within said storage space and against the inner wall surface of said base wall so as to permit the transfer of further amounts of said decay heat from all of said cans directly to said vessel.

4,680,160

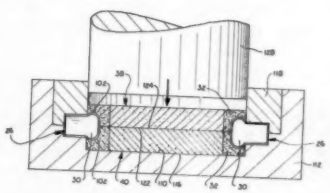
METHOD OF FORMING A ROTOR

Randolph C. Helmink, Indianapolis, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 11, 1985, Ser. No. 807,943

Int. Cl.[4] B22F 7/00

U.S. Cl. 419—6 **16 Claims**



1. A method of forming a rotor having a circular hub with a plurality of blades projecting from the hub, said method comprising the steps of forming a plurality of hub sections, said step of forming a plurality of hub sections including hot isostatically pressing powdered metal to at least partially form the hub sections, plastically deforming the hub sections by applying force against the hub sections while the hub sections are at a temperature below the gama-prime solvus temperature of the powdered metal which was hot isostatically pressed in forming the hub sections, thereafter, placing end portions of a plurality

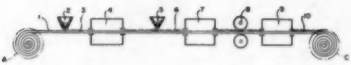
of blades between a pair of hub sections, and bonding the pair of hub sections together with the blades projecting from the hub sections.

4,680,161

METHOD OF PRODUCING SLIDING COMPOSITE MATERIAL

Takashi Muto, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Aug. 13, 1986, Ser. No. 896,018
Claims priority, application Japan, Sep. 2, 1985, 60-193384
Int. Cl.[4] B22F *5/00*
U.S. Cl. 419—3 **5 Claims**



1. A method of producing a composite sliding material provided with a metal strip, an adhesive layer bonded to the metal strip and surface layer bonded to the adhesive layer, comprising the steps of:

preparing the metal strip, a powder for the adhesive layer which powder contains no solid lubricant, and another powder for the surface layer which powder contains a solid lubricant;

disposing the powder for the adhesive layer onto the metal strip;

sintering the powder for the adhesive layer so that the adhesive layer bonded to the metal strip is formed;

disposing said another powder for the surface layer onto the sintered adhesive layer;

sintering said another powder disposed on the adhesive layer so that the surface layer bonded to the adhesive layer is formed; and

subjecting to a rolling operation the sintered surface layer and the adhesive layer bonded to the metal strip.

4,680,162

METHOD FOR PREPARING AG-SNO SYSTEM ALLOY ELECTRICAL CONTACT MATERIAL

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Continuation-in-part of Ser. No. 680,667, Dec. 11, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,430
Int. Cl.[4] C21D *1/00*
U.S. Cl. 419—21 **2 Claims**

1. A method of making electrical contact materials, comprising mixing powders of Sn, SnO and Ag in the weight percentages of 0.5–10% Sn, 0.5–15% SnO and the balance being Ag when the weight % of Sn is less than 4.5, said balance being Ag and at least one of In in the range of 0.1–5 weight % and Bi in the range of 0.01–5 weight %, when the weight % of Sn is greater than 4.5,

forming said mixture into a powdered-metallurgically prepared alloy compact, and

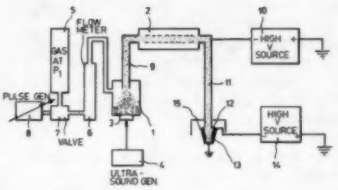
treating said alloy compact to effect complete internal oxidizing thereof.

4,680,163

PROCESS AND APPARATUS FOR STERILIZING CONTAINERS

Benno Blidschun, Herford, and Ernst G. Lierke, Schwalbach, both of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,311
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414268; Nov. 2, 1984, 3440014
Int. Cl.[4] A61L *2/18, 2/26*
U.S. Cl. 422—28 **31 Claims**



1. A process for sterilizing containers comprising the steps of:

agitating a liquid sterilizing agent at an ultrasonic frequency to cause atomization thereof whereby droplets are formed in a first zone;

entraining the atomized sterilizing agent in a carrier gas stream;

imparting an electrical charge to the droplets of atomized sterilizing agent; and

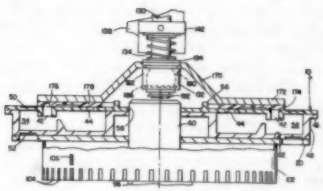
depositing the charged droplets of atomized sterilizing agent on a surface of a container to be sterilized under the influence of an electrostatic field by positioning the container to be sterilized within a cavity defined by a first electrode, positioning a second electrode at least partly within the container to be sterilized, and establishing the electrostatic field in a second zone distinct from said first zone, said second zone being located between the first and second electrodes.

4,680,164

CENTRIFUGAL ANALYZER

Norman G. Kelln, Spokane, Wash., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 18, 1985, Ser. No. 756,860
Int. Cl.[4] G01N *21/07*
U.S. Cl. 422—72 **14 Claims**



1. A centrifugal analyzer system that employs a centrifugal analyzer rotor in the concurrent analyses of a pluraity of fluid samples, each centrifugal analyzer rotor having a body portion that has a top surface and that defines a circumferential array of elongated cuvettes, and each cuvette having a loading port, comprising

an analysis compartment,

loading and analysis stations spaced from one another in said analysis compartment,

means at each of said loading and analysis stations for receiving a centrifugal analyzer rotor,

drive means at said analysis station for spinning a rotor at at least one thousand rpm for mixing sample and reagent materials in cuvettes of a rotor and for maintianing rotation of a rotor at a slower rotational speed during an analysis interval for the concurrent analyses of a plurality of fluid samples, said drive means having a rotation axis,

hold-down structure at said analysis station, said hold-down structure including

a support aligned with the rotation axis of said drive means,

an annular hold-down member secured to said support for free rotation relative to said support about said rotation axis of said drive means, for

accommodation means coupled between said support and said hold-down member for seating said hold-down member in engagement with a top surface of a rotor on said rotor receiving means at said analysis station, said accommodation means including a self-aligning bearing assembly,

guide structure for said support to maintain said support in alignment with the axis of said drive, and

means operative to move said hold-down member along the rotation axis of said drive means between a seating position in engagement with a rotor and a second position spaced from a rotor on said rotor receiving means at said analysis station to permit a rotor to be removed from said drive means.

4,680,165

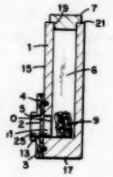
DOSIMETER FOR MONITORING VAPORS AND AEROSOLS OF ORGANIC COMPOUNDS

Tuan Vo-Dinh, 625 Gulfwood Rd., Knoxville, Tenn. 37923

Filed Mar. 19, 1982, Ser. No. 359,791

Int. Cl.[4] G01N *31/00*

U.S. Cl. 422—88 **2 Claims**



1. A dosimeter for in situ collection and direct detection of vapors and aerosols of polynuclear aromatic compounds by room temperature phosphorimetry comprising a base, a diffusion chamber secured to and extending outwardly from said base to define an open outer end of said chamber and an inner end of said chamber adjacent to said base, said base defining a bore terminating in register with said diffusion chamber and said bore containing a sorbent material and a grid whereby said sorbent material is maintained in spaced relation with filter paper which contains a heavy atom compound to collect said vapors and aerosols of polynuclear aromatic compounds by absorption, said filter paper having an exterior surface and being secured to said base adjacent to said inner end of said diffusion chamber with said exterior surface of said filter paper having exposure to said diffusion chamber, whereby, said heavy atom compound on said filter paper increases the absorptivity of said filter paper for said vapors and aerosols of polynuclear aromatic compounds during collection and enhances phosphorescence emission of said collected polynuclear aromatic compounds on said filter paper during detection, the dosimeter further comprising a solvent supplied to said sorbent material for improving the absorptivity of said filter paper containing a heavy atom compound.

4,680,166

ARRANGEMENT FOR CENTERING AND MANIPULATING CONDUITS IN A LARGE-AREA CELL FOR REPROCESSING IRRADIATED NUCLEAR FUEL

Jürgen Forster, Minden, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

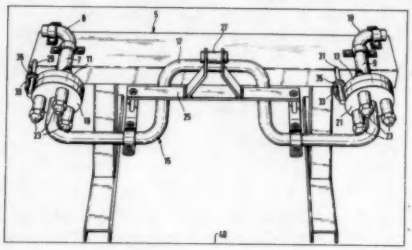
Filed Aug. 26, 1985, Ser. No. 769,585

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431325

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] G21C *19/44*

U.S. Cl. 422—159 **4 Claims**



1. In a large-area cell containing equipment for reprocessing irradiated nuclear fuels, the equipment having a stationary conduit with an end flange connectable to a removable conduit unit also having an end flange, said end flanges having respective rotational axes and conjointly defining an interface when disposed one next to the other, the large-area cell being equipped with remote handling apparatus for moving the removable flanged conduit unit relative to the stationary conduit, a centering and manipulating arrangement for facilitating the remotely manipulated connection of the end flange of the removable flanged conduit unit to the end flange of the stationary conduit, the arrangement comprising:

an upwardly open guide cradle attached to the peripheral edge of one of said end flanges, said cradle being mounted laterally on said one end flange and parallel to the rotational axis of said one end flange;

said guide cradle including a catch ring disposed thereon at a predetermined location rearward of the interface of the end flanges; and,

a guide pin fixedly mounted on the other one of said end flanges so as to be received in said guide cradle so as to extend through said catch ring when said end flanges are connected to each other.

4,680,167

CONTROLLED ATMOSPHERE OVEN

Thomas W. Orlando, San Antonio, Tex., assignor to Alcor, Inc., San Antonio, Tex.

Division of Ser. No. 465,109, Feb. 9, 1983, Pat. No. 4,568,426. This application Jan. 29, 1986, Ser. No. 823,637

Int. Cl.[4] B01D *3/42;* **F27B** *5/00;* **G01N** *31/12*

U.S. Cl. 422—199 **5 Claims**

1. An oven for heating a material in a preselected gas atmosphere, comprising:

a first chamber normally having a first gas therein, said first chamber having an opening for receiving said material therethrough and being adapted to receive said material therein;

means for sealing said opening in said first chamber after said material is received therethrough;

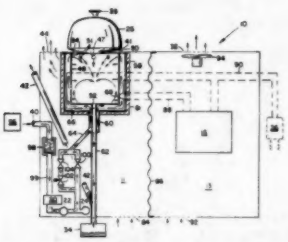
a second chamber surrounding said first chamber, said second chamber being adapted to receive said preselected gas therein and said first chamber having at least one gas inlet

port therethrough to permit said preselected gas to flow from said second chamber into said first chamber;

heating means located within said second chamber for heating said first chamber, thereby to heat said material therein;

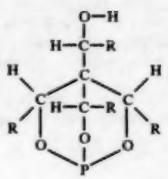
means for introducing said preselected gas to said second chamber to thereby displace said first gas from said first chamber, said first chamber having a gas outlet port therethrough to permit said first gas to flow outward therefrom during said displacement thereof by said preselected gas; and

first gas receiving means connected to said first chamber for receiving said first as during said displacement thereof by said preselected gas, said gas outlet port permitting communication between said first chamber and said first gas

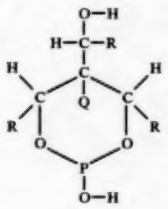


receiving means, wherein said second chamber comprises an outer chamber and an ante chamber in communication therewith, and the structure being such that said preselected gas is introduced to said ante chamber and said ante chamber surrounds said first gas receiving means, said preselected gas within said ante chamber causing said first gas to condense within said first gas receiving means;

said means for introducing a preselected gas to said second chamber including a plurality of gas conveying conduits which merge into one conduit feeding said preselected gas into said second chamber, with means for controlling the gas flow through said conduits to increase the flow rate of said preselected gas to said second chamber when purging said first chamber and when cooling said oven and to decrease the flow rate during heating of said material.



wherein each R individually represents a hydrogen atom or an alkyl group having not more than three carbon atoms, or of the formula



wherein Q represents a hydrogen atom or an alkyl group having not more than three carbon atoms or a group of the formula

and R, in each occurrence, represents a hydrogen atom or an alkyl group having not more than three carbon atoms, to obtain an aqueous extract phase containing at least a portion of said metals and an organic raffinate phase from which said metals have at least in part been extracted, and (b) phase separating the aqueous extract phase from the organic raffinate phase.

4,680,168

EXTRACTION OF GROUP 8 METALS FROM ORGANIC SOLUTIONS

Brian L. Goodall, and Paulus A. M. Grothenhuis, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 10, 1986, Ser. No. 872,569

Claims priority, application United Kingdom, Jun. 20, 1985, 8515656

Int. Cl.[4] C01G *55/00*

U.S. Cl. 423—22 **20 Claims**

1. A process for the extraction of one or more metals of Group 8 of the Periodic Table of the Elements from an organic medium, which comprises (a) contacting the organic medium with an aqueous phase in the presence of a cyclic phosphite of the formula

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4,680,169

REMOVAL OF AMMONIUM ION FROM ACIDIC LIQUORS

Thomas R. Morgan, Jordan, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 30, 1985, Ser. No. 814,831

Int. Cl.[4] C01B *21/00*

U.S. Cl. 423—53 **4 Claims**

1. A process for reducing ammonium ion concentration in an ammonium ion-containing, acidic liquor comprising sodium dichromate and having a pH of 2.5–4.5, said process comprising oxidatively converting ammonium ion in said acidic liquor, to nitrogen with a reagent consisting essentially of a persulfate at a temperature above ambient.

4,680,170

SYNTHESIS OF ZEOLITIC MATERIALS USING ION-EXCHANGE RESIN

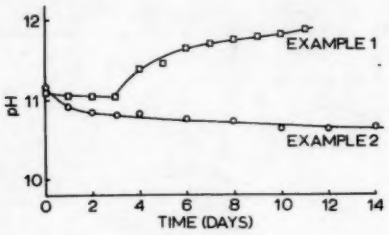
Barrie M. Lowe, Edinburgh, Scotland, and Stuart G. Fegan, Pretoria, South Africa, assignors to Imperial Chemical Industries PLC, England

Filed Apr. 10, 1985, Ser. No. 721,605

Claims priority, application United Kingdom, Apr. 10, 1984, 8409285

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—329 11 Claims



1. A method for the preparation of a crystalline zeolite material which comprises reacting an aqueous mixture comprising at least one source of silica and an ion exchange resin, and crystallizing the resulting zeolite material at a temperature no greater than the decomposition temperature of the ion exchange resin, said ion exchange resin maintaining the pH of the reaction mixture at a relatively constant level.

4,680,171

VISUALIZATION OF A BLOODSTREAM CIRCULATION WITH BIODEGRADABLE MICROSPHERES

William Shell, 956 Chantilly Rd., Los Angeles, Calif. 90077

Filed Mar. 15, 1985, Ser. No. 712,038

Int. Cl.[4] A61K *49/04*

U.S. Cl. 424—5 3 Claims

1. A method of visualizing an arterial circulation in the bloodstream of a subject comprising the steps of:

(a) selecting a quantity of microspheres bearing an x-ray absorbent material which will enable generation of an x-ray image and for a desired duration when injected into the bloodstream of a subject;

(b) injecting biodegradable x-ray absorbent microspheres into the bloodstream of the subject at a point in the subject's circulatory system such that said microspheres are carried in the bloodstream to an arterial circulation area sought to be visualized and which remain in the circulatory system for a time sufficient to be subjected to X-ray imaging;

(c) subjecting said arterial circulation area to X-rays to form an X-ray image of said arterial circulation area and causing the microspheres to absorb the X-rays to render them X-ray opaque for contrast against surrounding or adjacent tissue;

(d) examining said X-ray image for the pressure of white areas on an X-ray film to represent the presence of said microspheres, which will enable visualization of said arterial circulation by means of the absorption of X-rays by said microspheres; and

(e) thereafter permitting the microspheres to become degraded in the body after a period of time for visualization which is sufficient to enable X-ray imaging but which is not sufficiently long to create damage to the tissue in which the visualization of the arterial circulation is taking place.

4,680,172

DEVICES AND METHODS FOR TREATING MEMORY IMPAIRMENT

Lewis J. Leeson, Roseland, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 5, 1985, Ser. No. 708,466

Int. Cl.[4] A61F *7/02*

U.S. Cl. 424—449 11 Claims

1. A device for the transdermal administration of a drug for the treatment of memory impairment comprising

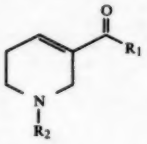
(a) a drug impermeable backing layer;

(b) a drug permeable rate controlling membrane sealed to one side of said backing layer as to define at least one drug reservoir compartment therebetween;

(c) an adhesive layer;

(d) a drug or composition thereof within said hollow drug reservoir;

said drug comprising a memory improving effective amount of a compound having the formula



(I)

wherein R_1 is OH, lower alkoxy, or NR_3R_4; and each of R_2, R_3 and R_4 is independently H or lower alkyl; said composition comprising said drug and at least one pharmaceutically acceptable adjunct; whereby said drug is delivered in a controlled, continuous manner to a patient to which said device has been applied.

4,680,173

AEROSOL DISPENSING SYSTEM

Norman D. Burger, 11621 Segrell Way, Culver City, Calif. 90230, assignor to Norman D. Burger, Los Angeles and Nicholas A. Mardesich, Palos Verdes Estates, both of, Calif., a part interest

Continuation-in-part of Ser. No. 193,350, Oct. 2, 1980, which is a continuation of Ser. No. 789,639, Apr. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 727,799, Oct. 1, 1976, abandoned. This application Apr. 9, 1981, Ser. No. 252,306

Int. Cl.[4] A61K *7/38, 9/12*

U.S. Cl. 424—47 14 Claims

1. In an aerosol system for dispensing an antiperspirant where the system includes a metal container having a valve-controlled spray, a valve for dispensing the contents thereof, and a dip tube extending from said valve to said container contents, a propellant for said system, and wherein said contents includes an anti-perspirant material such as the astringent salts of multi-valent cations, divalent astringent salts, trivalent astringent salts, tetravalent astringent salts and aluminum astringent salts, wherein said anti-perspirant material if dissolved in water forms a material corrosive with respect to the exposed metal of said container, the improvement comprising:

a super-hydrophobic powdered fumed silica having a particle size of between 0.007 microns and 15 nm, a surface area of from 120 m^2/g to 225 m^2/g as measured by the nitrogen adsorption, B.E.T., a bulk density of from 3 to 10 $lbs./ft^3$,

said super-hydrophobic silica being present in an amount of up to about 5.5% by weight of the container contents,

water in an amount sufficient to increase the effectiveness of said anti-perspirant material, and

said super-hydrophobic fumed silica encapsulating at least said water to form a multiplicity of encapsulated drops whose outer surface is the fumed silica and whose contents include at least said water, thereby to prevent contact between said water and any exposed metal of said metal container.

4,680,174
INDUCTION OF IMMUNE RESPONSE BY IMMUNIZATION WITH ENCAPSULATED ANTIGEN-PRODUCING CELLS

Allan P. Jarvis, Jr., Newburyport; George A. Koch, Medfield, both of Mass., and Paul G. Abrams, Washington, D.C., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Filed May 24, 1984, Ser. No. 613,803

Int. Cl.[4] A61K *39/395;* **C12N** *15/00;* **C12P** *21/00*

U.S. Cl. 424—85 **30 Claims**

1. A process for inducing an immune response in an animal body, said process comprising the steps of:

A. providing a living cell which secretes an antigen capable of inducing an immune response in said animal body;

B. encapsulating said cell within a membrane comprising pores and defining an intracapsular volume with which said cell is suspended;

C. controlling the dimensions of the pores to permit passage therethrough of said antigen but to preclude passage therethrough of said cell;

D. implanting said encapsulated cell in said animal body;

E. permitting said secreted antigen to traverse said membrane within said animal body to induce an immune response; and

F. harvesting an antibody complementary to said antigen from the circulatory system of said animal body.

4,680,175
INTERFERON ADMINISTRATION VEHICLES

Leonard F. Estis, North Brunswick; Sean A. Evans, High Bridge, and Douglas Testa, Neshanic Sta., all of N.J., assignors to Interferon Sciences, Inc., New York, N.Y.

Filed Feb. 7, 1984, Ser. No. 577,911

Int. Cl.[4] A61K *45/02, 31/745*

U.S. Cl. 424—85 **11 Claims**

1. An interferon preparation to be administered topically to a patient suffering from a disease which responds therapeutically to interferon comprising:

(a) one or more interferons, the amount of the one or more interferons being sufficient to therapeutically affect the disease from which the patient is suffering;

(b) a vehicle base compatible with the interferon or interferons being administered; and

(c) an effective amount of one or more protease inhibitors for the purpose of reducing the rate of decay of the biological activity of the interferon or interferons due to proteolytic agents.

4,680,176
DELETION MUTANT OF A HERPESVIRUS AND VACCINE CONTAINING SAID VIRUS

Antonius J. M. Berns, Grave, and Arnold L. J. Gielkens, Lelystad, both of Netherlands, assignors to Centraal Diergeneeskundig Instituut, Lelystad, Netherlands

Filed Oct. 12, 1984, Ser. No. 660,097

Claims priority, application Netherlands, Oct. 12, 1983, 8303501

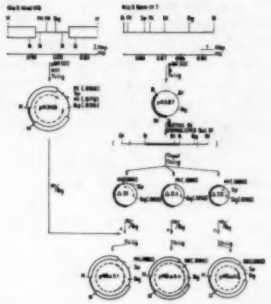
Int. Cl.[4] A61K *39/12;* **C12N** *15/00, 7/04*

U.S. Cl. 424—89 **8 Claims**

1. A live deletion mutant of a pseudorabies virus derived from a parental strain having a parental genome of about 160,000 nucleotide pairs, said parental genome comprising

(a) two inverted repeats, each of which contains cleavage sites for the restriction endonucleases BamHI and KpnI, BamHI digestion of the parental genome yielding two pairs of restriction fragments derived entirely from the sequence of the inverted repeats, the larger fragment of each pair being designated as BamHI fragments 5; and KpnI digestion of the genome yielding two fragments, designated KpnI fragment E and kpnI fragment H, each of said KpnI fragments containing the distal end of one of the inverted repeats;

(b) a unique sequence located between the inverted repeats, said unique sequence comprising a BamHI restriction fragment of about 7 kilobase pairs in length designated BamHI fragment 7, said BamHI fragment 7 containing a cleavage site for the restriction endonuclease SalI, wherein cleavage at the SalI site produces two unequal fragments from BamHI fragment 7, one fragment of about five kilobase pairs in length and the other of about two kilobase pairs in length; and



(c) a gene for thymidine kinase, said deletion mutant being characterized by one or more deletions, said deletions being located in

(i) a portion of an inverted repeat which is common to BamHI fragment 5 and either KpnI fragment E or KpnI fragment H;

(ii) the about five kilobase pair SalI fragment of BamHI fragment 7, or

(iii) both.

4,680,177
PROCESSES FOR THE PRODUCTION OF BLOOD PRODUCTS

Charles R. W. Gray, Forest Row, and Neville Crawford, St. Albans, both of England, assignors to Trustees of the Garfield Weston Trust for Research into Heart Surgery; The Royal College of Surgeons of England and British Postgraduate Medical Federation, all of London, England

PCT No. PCT/GB83/00127, § 371 Date Jan. 3, 1984, § 102(e) Date Jan. 3, 1984, PCT Pub. No. WO83/03830, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 28, 1983, Ser. No. 579,905

Claims priority, application United Kingdom, Apr. 28, 1982, 8212306

Int. Cl.[4] A61K *35/14, 35/16, 35/18, 35/28*

U.S. Cl. 424—101 **14 Claims**

1. A process for the production of products for clinical use chosen from blood proteins, blood cells, plasma proteins, plasma cells, bone marrow proteins, or bone marrow cells comprising

treating freshly shed blood or fresh bone marrow with an anticoagulant comprising a neutral salt which does not bind calcium ions,

thereafter deriving said products for clinical use from the treated blood or marrow, and then reducing the toxicity of said products by removal of the ions of the salt below their toxic levels.

4,680,178

ANTITUMOR AGENT COMPRISING FR-900216

Sumio Kiyoto, Ikeda; Masakuni Okuhara, Sakura; Eiko Kino, Tsuchiura; Hirokazu Tanaka, Sakura; Hatsuo Aoki, Ikeda; Masanobu Kohsaka, Sakai, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1984, Ser. No. 631,244

Claims priority, application Japan, Jul. 21, 1983, 58-133506; Mar. 2, 1984, 59-40748

Int. Cl.[4] A61K *35/70, 35/72, 31/42*

U.S. Cl. 424—122 2 Claims

2. A method of treating lymphocytic leukemia, melanoma or mammary carcinoma in a subject in need of such treatment comprising administering to said subject an effective amount of a pharmaceutical composition comprising an effective amount of FR-900216 substance having the following physical and chemical properties:

(1) Molecular weight:

625 (Mass spectrum)

(2) Molecular formula:

$C_{35}H_{47}NO_9$

(3) Melting point:

130°–135° C. (dec.)

(4) Specific rotation:

$[\alpha]_D^{20} = +140°$ C. (c=1, $CHCl_3$)

(5) Ultraviolet absorption spectrum:

$\lambda_{max}^{CH_3OH}$ = 232 nm (ε = 11,300)

= 238 nm (sh.)

= 285 nm (sh.)

= 296 nm (ε = 55500)

= 308 nm (ε = 70300)

= 324 nm (ε = 51900)

(6) Infrared absorption spectrum:

ν_{max}^{KBr}: 3450, 3140, 2960, 2920, 1730, 1715 (sh.), 1607, 1575, 1455, 1445, 1435, 1377, 1360, 1343, 1305, 1280 (sh.), 980, 970, 950, 930, 915, 905, 895, 875, 860, 850, 835, 825, 790, 780, 755, 705, 670, 635, cm^{-1}

(7) ^1H Nuclear magnetic resonance spectrum ($CDCl_3$, inner standard: tetramethylsilane):

as shown in FIGURE of the accompanying drawing,

(8) ^{13}C Nuclear magnetic resonance spectrum ($CDCl_3$, inner standard: tetramethylsilane):

δ (ppm): 9.65, 11.41, 11.71, 13.77, 14.32, 19.93, 22.57, 29.24, 31.49, 31.85, 34.16, 35.86, 36.40, 37.98, 45.32, 54.18, 56.12, 63.77, 65.10, 76.81, 82.33, 89.25, 120.80, 123.77, 126.44, 129.29, 135.97, 136.21, 136.57, 137.67, 138.51, 139.54, 160.84, 168.01, 169.34

(9) Solubility:

Freely soluble: methanol, ethanol, acetone, ethyl acetate

Soluble: chloroform, benzene

Slightly soluble: hexane, diethyl ether

Insoluble: water

(10) Color reaction:

Positive: Dragendorff's reaction, iodine reaction

Negative: Ferric chloride reaction, Molisch's reaction, Ninhydrin reaction, Ehrlich's reaction

(11) Nature:

Weakly basic substance or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,680,179

COCONUT FRUIT(S) FLAVORED BRANDY

Leonida L. M. Lidman, 12 Irwin Pl., Hazlet, N.J. 07730

Filed Jul. 20, 1984, Ser. No. 633,058

Int. Cl.[4] C12G *1/00*

U.S. Cl. 426—15 8 Claims

1. In the process of producing coconut brandy, according to the steps of (1) utilizing boiled spring water and finely ground sulphur to thin out the sap of unopened coconut inflorescence, (2) boiling the resulting sap mixture while stirring same, (3) trapping the vapor produced through said boiling and (4) condensing said vapor in a sealed container to produce the brandy product, wherein the improvement comprises at least one of:

(a) substituting calamansi juice and jackfruit meat for said finely ground sulphur so as to improve the clarity of the coconut brandy produced; and

(b) substituting the juice from 5–18 day old coconut for said boiled spring water so as to improve the consistency of the coconut brandy produced.

4,680,180

LOW ALCOHOL BEER PREPARED WITH HYDROGENATED STARCH HYDROLYZATE

Guy Bussiere, La Gorgue; Marius Zimmermann, Hazebrouck, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

Filed May 9, 1984, Ser. No. 608,445

Claims priority, application France, May 11, 1983, 83 07922

Int. Cl.[4] C12C *11/04, 9/00*

U.S. Cl. 426—16 8 Claims

1. In a process for manufacturing a low alcohol-content beer comprising the successive steps of

mashing consisting in heating a mixture of malt and water,

filtering of the resulting product obtained by mashing to provide draff and a wort,

washing of the draff,

diluting of the wort,

sterilizing of the wort by boiling in the presence of hops,

cooling and filtering of the wort,

seeding of the wort with yeast,

fermenting of the yeast-containing wort to produce beer,

the improvement comprising replacing, before the sterilization of the wort by boiling in the presence of hops, a proportion of the malt by an equivalent amount of a hydrogenated starch hydrolysate whose composition on dry matter is as follows:

content of substances of DP 1 (degree of polymerisation) between 0.1 and 35%,

content of substances of DP 2 between 0.1 and 45%,

content of products of DP>20 less than 45%,

the remainder of content being up to 100% with substances of DP 3 to 20,

the amount of hydrogenated starch hydrolysate being selected such that the final beer is provided with 0.1 to 2% by weight of the said hydrogenated hydrolysate.

4,680,181

CHEESE PRODUCT AND METHOD OF MANUFACTURE

Michael Leavitt, Hamilton, and David S. Huls, Corvallis, both of Mont., assignors to Hamilton House Marketing, Inc., Missoula, Mont.

Continuation of Ser. No. 575,821, Feb. 1, 1984, abandoned. This application Jan. 3, 1986, Ser. No. 816,682

Int. Cl.[4] A23C *19/02*

U.S. Cl. 426—36 13 Claims

1. A method for making a resultant cheese having discrete cheddared curd pieces within a matrix of stirred curds in which the resultant cheese does not have a tendency to separate along distinct boundaries that define zones, and has a flavor distinct from those of its component curds and the ability to age without the resulting deterioration of flavor and

consistency common to stirred curd cheese, comprising the following steps:

(a) treating a first quantity of milk with a starter to ripen the milk;

(b) treating the ripened first quantity of milk with a coagulating agent to form a first coagulated mass of a first curd and a first whey;

(c) cutting the first coagulated mass to facilitate the separation of the whey from the curd;

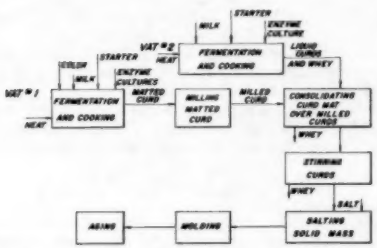
(d) heating and stirring the cut mass to further facilitate the separation of the whey from the curd;

(e) removing the whey leaving a resultant curd;

(f) cheddaring the resultant curd to elongate the resultant curd and reduce the moisture content and increase the acidity of the resultant curd to form firm, discrete cheddared curd pieces;

(g) treating a second quantity of milk with a starter to ripen the milk;

(h) treating the ripened second quantity of milk with a coagulating agent to form a second coagulated mass of a curd and a whey;



(i) cutting the second coagulated mass to facilitate the separation of the whey from the curd;

(j) heating and stirring the cut second mass separate and apart from the first mass to facilitate the separation of the whey from the curd and form a heated fluid mass of stirred curd and stirred curd whey;

(k) intermixing the heated fluid mass of stirred curd and stirred curd whey with the firm, discrete cheddared curd pieces;

(l) removing the stirred curd whey from the intermixed stirred curd and the firm, large, discrete cheddared curd pieces to form an integral solid cheese mass containing discrete cheddared curd pieces within a matrix of the stirred curd;

(m) salting both the stirred curd and cheddared curd pieces while they are being intermixed and prior to formation of the integral cheese mass; and

(n) placing the integral solid cheese mass into a container and pressing the integral solid cheese mass to its desired final density to form the resultant cheese.

4,680,182

BAKER'S DOUGH

Masanobu Kawai, 3-25-15, Moridai, Atsugi-Shi, Kanagawa-ken, Japan

Filed Apr. 24, 1984, Ser. No. 603,479

Claims priority, application Japan, May 2, 1983, 58-78033

Int. Cl.[4] A21D *10/00, 8/04*

U.S. Cl. 426—62 **2 Claims**

1. A baker's dough which comprises wheat flour and a yeast selected from the group consisting of *Saccharomyces uvarum* TS-1-98 (FERM BP 472), *Saccharomyces chevalieri* A-080-8 (FERM BP 471) and *Saccharomyces chevalieri* A-080-70 (FERM BP 474).

4,680,183

PROCESS FOR MAKING A FOOD PRODUCT FROM CHEAP MEAT CHUNKS

Gerrit A. van Schouwenburg, 14, ch. de Pierre-Longue, Grand-Lancy, Switzerland

PCT No. PCT/CH84/00191, § 371 Date Jul. 30, 1985, § 102(e) Date Jul. 30, 1985, PCT Pub. No. WO85/02520, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 7, 1984, Ser. No. 763,144

Claims priority, application Switzerland, Dec. 12, 1983, 6621/83

Int. Cl.[4] A23L *1/317*

U.S. Cl. 426—64 **10 Claims**

1. A process for making a food product from meat chunks and having the appearance and organoleptic qualities of natural uncooked meat, said food product having a moisture content between approximately 30 and 80% and a fat content less than or equal to 30%, and in which undesirable portions of said meat chunks have been removed comprising the steps of:

forming a substantially smooth and homogenous paste from said meat chunks with a particle size in the range of 2 mm or less;

adding a small quantity of salt sufficient to partially solubilize the proteins in said paste and mixing said salt and paste to partially solubilize a portion of the proteins in said paste;

shaping said paste into slices which are 3 mm or less in thickness; and

stabilizing said slices by applying sufficient heat to at least partially coagulate said partially solubilized proteins thereby producing a connective network between the particles of said paste slices without substantially altering the non-solubilized portion of said slices.

4,680,184

EMULSIFIER FORMULATION FOR COOKIES

Paul Seiden, and Martin A. Mishkin, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 12, 1985, Ser. No. 722,927

Int. Cl.[4] A23L *1/035;* **B01F** *17/00*

U.S. Cl. 426—654 **18 Claims**

1. An emulsifier composition for use in cookie dough containing crystallization-resistant sugar comprising:

(a) from about 40% to about 90% by weight of the composition, on the basis of monoglyceride content, fatty acid mono-diglycerides having from about 35% to about 99% fatty acid monoglycerides, and from about 1% to about 50% fatty acid diglycerides, wherein at least about 65% of said fatty acids are selected from the group consisting of C_{14}–C_{20} saturated fatty acids and C_{16}–C_{20} trans-unsaturated fatty acids and mixtures thereof;

(b) from about 5% to about 55% by weight of the composition of fatty acid esters of polyols having an average of from about 4 to about 14 hyroxyl groups, wherein from about 10% to about 66% of the hydroxyl groups are esterified, and wherein at least about 65% of said fatty acids are selected from the group consisting of C_{14}–C_{20} saturated fatty acids and C_{16}–C_{20} trans-unsaturated fatty acids and mixtures thereof; and

(c) from about 5% to about 55% by weight of the composition of fatty acid monoglyceride esters of polycarboxylic acids and their derivatives, wherein at least about 65% of said fatty acids are selected from the group consisting of C_{14}–C_{20} saturated fatty acids and mixtures thereof.

4,680,185
INFUSION PACKAGE

Barbara D. Ilik, 17658 NE. Couch, Portland, Oreg. 97230

Filed Feb. 6, 1986, Ser. No. 826,742
Int. Cl.[4] A47G *19/16*
U.S. Cl. 426—83 **10 Claims**

1. An infusion package comprising a first water pervious side panel and a second water pervious side panel, said side panels being joined together adjacent their edge margins to define an enclosure with one open side forming a mouth through which material may be added to the package, said side panels being flexible and capable of having portions thereof folded over toward one side of the package to close said mouth, an elongate flexible member secured adjacent one of its ends to the outer side of said first side panel in the region that is to be folded over, such that said member remains on the outside of said package when said portions of the panels are folded over, and means defining an aperture on said package adjacent the joined edge margins of said side panels in a region opposite said mouth but not extending into the interior of the package, said aperture being adapted to receive a portion of said flexible member therethrough when said flexible member is fed down from the folded portions and across said second side panel with remainder portions of said member remote from said secured one end extending beyond through and beyond said aperture in a direction away from said mouth, such that a user may hold said remainder portion of said flexible member to suspend said package in an inverted orientation with the folded over portions of the side panels at the bottom of the suspended package and maintained closed by said flexible member in said inverted position.

4,680,186
PORTION CONTROLLED SLICED FRESH WHOLE MUSCLE MEAT PRODUCT

Roger C. Sheehy, Providence, R.I., and Irwin Muskat, Manchester, N.H., assignors to Granite State Packing Company, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 670,362, Nov. 9, 1984, Pat. No. 4,574,087. This application Dec. 17, 1985, Ser. No. 810,078
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—129 **8 Claims**

1. A process of producing a series of portion-controlled packaged fresh boneless sliced whole muscle red-blooded meat product the slices of which are of substantially the same weight and size, comprising the following steps:

(1) trimming a series of fresh, boneless red-blooded whole muscle meat pieces of a single cut but of varying weights, squaring each piece;

(2) sorting and grouping the pieces so trimmed into at least three weight ranges, the pieces in each weight range having a length equal to the median length thereof, ±7%, along the longitudinal axis of the muscle;

(3) setting the blade spacing and number of blades of a single pass multi-blade slicer to suit said median length for one of said weight range groups of said pieces, as confined under pressure as specified in step 4, and produce slices therefrom of a pre-determined weight for each slice, including the two end slices;

(4) passing said pieces of said one weight range group one at a time across the grain through said multi-blade slicer under confining pressure to reduce the unrestrained length of each piece by at least 7% but without distortion or buckling of the muscle, said confining pressure being effected by having each piece forcibly passed under the pressure of a ram through two confining end walls and under a confining top surface pressing the piece against a bottom surface on which the piece rests to give a rectangular confining passageway thereby cutting each piece into slices of said predetermined weight;

(5) similarly setting the blade spacing and number of blades of a single pass multi-blade slicer to suit said median lengths for each of the other of the said weight range groups of pieces and produce slices therefrom of said pre-determined weight for each slice, and slicing each said weight range group as in step 4; and

(6) packing said pieces so sliced for shipment;

said pieces and the slices therefrom having not been crust chilled or frozen at any time during processing.

4,680,187
PORTION CONTROLLED SLICED COOKED WHOLE MUSCLE MEAT PRODUCT

Roger C. Sheehy, Providence, R.I., and Irwin Muskat, Manchester, N.H., assignors to Granite State Packing Company, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 630,362, Nov. 9, 1984, Pat. No. 4,574,087. This application Dec. 17, 1985, Ser. No. 810,075
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—129 **12 Claims**

1. A process of producing a series of portion controlled sliced cooked whole muscle boneless meat selected from the group consisting of roast prime rib, sirloin strip and pork loin, the slices of which are of a substantially uniform thickness, weight and plate coverage, comprising the following steps:

(1) trimming a batch of at least 25 pieces of said whole muscle boneless meat;

(2) cooking the pieces to a pre-determined degree of doneness;

(3) removing said pieces from the cooking means and while said pieces so cooked are still hot:

(a) sorting and grouping each of said pieces into at least two weight ranges, A and B;

(b) compacting the pieces in each weight range group against the longitudinal axis of the muscle to a pre-determined length for each of said weight ranges;

(c) chilling each piece while so compacted;

(4) setting the blade spacing and number of blades of a first single pass multi-blade slicer to suit said pre-determined length for said weight range A group of said pieces as crimped as stated in step 5, and produce slices therefrom of a pre-determined weight for each slice including the two end slices;

(5) passing said pieces of said weight range A group while still chilled one at a time across the grain through said multi-blade slicer while maintaining the ends of a piece as it passes therethrough under a confining pressure to reduce the unrestrained length of each piece by at least 3% but without dislocation or buckling of the muscle thereby cutting each piece into slices of said predetermined weight including the two end slices;

(6) setting the blade spacing and number of blades of a second single pass multi-blade slicer to suit said pre-determined length for said weight range B group of pieces and product slices therefrom of said pre-determined weight for each slice including the two end slices;

(7) passing said pieces of said weight range B group one at a time sideways through said second single pass multi-blade

slicer while maintaining the ends of a piece as it passes therethrough under a confining pressure to reduce the unrestrained length of each piece by at least 3% but without dislocation or buckling of the muscle; and

(8) vacuum packing said pieces so sliced for shipment,

said slicing and all steps subsequent thereto being done in a manner to virtually exclude air from contacting the faces of facing slices.

4,680,188

PROCESS FOR IMPROVING THE TECHNICAL EFFICIENCY AND PRESERVATION QUALITY OF CANNED MUSHROOMS

Claude Agulhon, Varrains, France, assignor to Royal Champignon, Saumur, France

Continuation of Ser. No. 505,013, Jun. 10, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 852,392
Claims priority, application France, Jun. 11, 1982, 82 10373
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—281 **7 Claims**

1. A process of canning mushrooms consisting essentially of steps (a) to (g) in the following order:

(a) dressing the mushrooms and immersing the dressed mushrooms in an edible aqueous saline solution containing between about 15 g/l and 60 g/l of NaCl;

(b) subjecting the immersed mushrooms to a reduced absolute pressure of between about 12 mm and 15 mm Hg for a time effective to deaerate the mushrooms;

(c) increasing the pressure to about ambient pressure;

(d) allowing the mushrooms immersed in said edible aqueous saline solution to stand at a temperature and for a period of time effective to attain a net drained weight within about 5% or less of the net drained weight of the mushrooms prior to dressing;

(e) draining the mushrooms and placing the drained mushrooms in a can;

(f) juicing the mushrooms with water; and

(g) sealing the can; with the proviso that the mushrooms are not subjected to blanching.

4,680,189

INGESTIBLE, HIGH DENSITY, COMPRESSED-TABLET FIBER-COMPOSITION

Robert W. Schumacher, Kenvil, and Mary B. Houston, Morristown, both of N.J., assignors to Warner-Lambert Company

Filed Jul. 7, 1986, Ser. No. 882,799
Int. Cl.[4] A23L *1/29*
U.S. Cl. 426—285 **22 Claims**

1. A method for preparing an ingestible, high density, compressed-tablet fiber-composition which comprises:

(A) blending at least one high fiber source and a microcrystalline cellulose compression aid to form a homogenous blend:

(B) mixing water with the blend of step (A) at a weight ratio of about 1.5:1 to about 2.5:1, based on the weight of water to the weight of the blend, for a time sufficient to form a cohesive, deformable, plastic mass;

(C) drying the plastic mass of step (B) to a moisture content of less than abut 8% by weight, based on the weight of the dried material;

(D) milling the dried product of step (C) to recover granules having a particle size of about 125 to about 840 microns;

(E) blending the granules of step (D) with a tableting lubricant; and

(F) compressing the composition of step (E) into a tablet to form a high density, fiber tablet containing about 30% to about 95% dietary fiber, based on the total weight of the compressed-tablet fiber-composition.

4,680,190

DATE PROCESSING METHOD

Albert Spiel, Yonkers, N.Y., and Henry C. Spanier, West Milford, N.J., assignors to Nabisco Brands, Parsippany, N.J.

Continuation of Ser. No. 732,738, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 544,182, Oct. 21, 1983, Pat. No. 4,578,275. This application Aug. 19, 1986, Ser. No. 898,777
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—302 **6 Claims**

1. Process for treating light colored, sucrose-type dates grown domestically to impart thereto the darker appearance, the flavor, the soft-chewy texture and the shelf-stability of imported invert sugar-type dates grown in the Middle East region, comprising:

(a) steaming the domestic dates at a temperature and for a period of time which are sufficient to darken the domestic dates to substantially the same darkness as that of imported dates, said temperature being at least 175° F.; and

(b) drying the steamed domestic dates to provide shelf-stable, treated dates, the size and shape of said shelf-stable, treated domestic dates being substantially the same as the size and shape of said starting domestic dates,

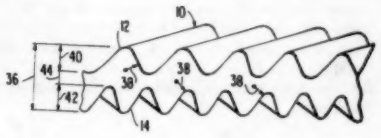
said shelf-stable, treated domestic dates not having been expanded from the original size of said starting domestic dates, before or during step (a) or between steps (a) and (b) or during step (b) and no composition containing at least one saccharide sugar sweetening agent contacting or being applied to said starting domestic dates before or during step (a) or between steps (a) and (b) or during step (b).

4,680,191

CROSS-CUT EXTRUSION METHOD

David L. Budd, Plano, and David P. Fowler, Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Feb. 5, 1985, Ser. No. 698,250
Int. Cl.[4] A21D *8/00*; A23P *1/12*
U.S. Cl. 426—439 **20 Claims**



1. A method of making an extruded substantially planar snack food product having a variety of texture characteristics, the product having a plurality of parallel ridges and valleys on one face and a plurality of parallel ridges and valleys on an opposite face, the parallel ridges and valleys on the two faces extending at an angle relative to each other, the method comprising:

(a) extruding edible material to form a moving imperforate tubular member of said edible material, the tubular member having non-intersecting parallel ridges and valleys on the inside and outside surfaces of the tubular member formed during extrusion and during movement of the extruded tubular member to thereby produce an extruded tubular member having parallel ridges and valleys extending in a substantially helical pattern on at least one surface of the tubular member with the parallel ridges and valleys on the inside and outside surfaces extending at an angle relative to each other; and

(b) forming the extruded member into a substantially planar snack food product having a variety of texture characteristics.

4,680,192

APPARATUS AND METHOD FOR PROCESSING FAVA BEANS HAVING PODS AND SEEDS

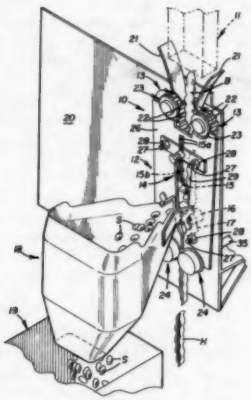
John Boggiano, 7899 DeMartini La., Linden, Calif. 95236

Continuation-in-part of Ser. No. 725,004, Apr. 19, 1985, Pat. No. 4,621,572. This application May 21, 1986, Ser. No. 865,885

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] A23N *5/00*

U.S. Cl. 426—482 18 Claims



1. An apparatus for processing beans having pods and seeds retained in said pods, said apparatus comprising

first means for moving said beans along an at least substantially vertical path comprising a pair of endless belts extending in the direction of said path and positioned adjacent to each other to receive said beans therebetween,

second means, including a stationary cutting blade positioned to extend into said path, for cutting said pods at a controlled depth during movement of said beans along said path with said beans being frictionally gripped between said belts to facilitate separation of said seeds from said pods, and

third means for squeezing said pods to force said seeds out of said pods.

4,680,193

SOLUBILIZATION OF TEA IN COLD WATER WITH CATECHIN

Tito-Livio Lunder, Lausanne; Birgit Hoffmann, Vandoeuvres, and Corine-Madeleine Nielsen, Lausanne, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 788,470, Oct. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 732,167, May 8, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,442

Int. Cl.[4] A23F *3/16*

U.S. Cl. 426—597 14 Claims

1. A process which comprises treating an extract of black tea containing tea cram with at least one catechin compound in an amount effective to render the tea cream in the extract soluble in cold water at a temperature of from 10° C. to 30° C.

4,680,194

PROCESS OF PREPARING FOOD PRODUCTS

Stanley A. R. Kilroy, Donvale, Australia, assignor to Alpen Dairy Foods Pty. Limited, Donvale, Australia

Continuation-in-part of Ser. 513,968, filed as PCT AU82/00183, Nov. 11, 1982, published as WO83/01728, May 26, 1983, Pat. No. 4,551,346. This application Nov. 4, 1985, Ser. No. 794,437

Claims priority, application Australia, Nov. 11, 1981, PF1515

Int. Cl.[4] A23D *3/02*

U.S. Cl. 426—602 4 Claims

1. A method of producing a food product containing an edible fat which comprises the steps of:

(a) preparing an aqueous phase comprising proteinaceous milk solids containing precipitated proteins, an aqueous carrier and an amount of peptising agent effective to peptise said precipitated proteins,

(b) agitating and heating the aqueous phase to a temperature greater than about 65° C. and for a time both effective to complete the action of the peptising agent on the precipitated proteins in the milk solids and thereby produce a sol,

(c) homogenously mixing with the sol an edible fat to produce an oil-in-water emulsion, and

(d) cooling the emulsion to a temperature below 5° C. at which phase inversion occurs to a water-in-oil emulsion.

4,680,195

HOMOPOLYMERS, COPOLYMERS AND COATED MATERIAL AND ITS USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1985, Ser. No. 732,334

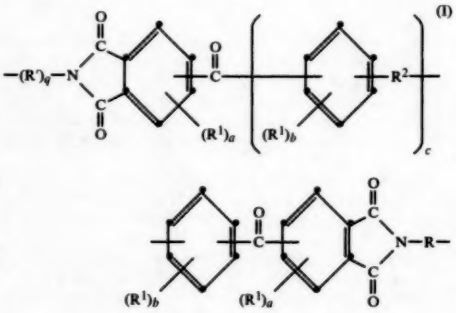
Claims priority, application Switzerland, May 17, 1984, 2417/84

Int. Cl.[4] C08J *7/04;* G03C *5/16*

U.S. Cl. 427—44 20 Claims

1. A process for the preparation of a protective film which comprises

irradiating with high-energy radiation a coated material composed of a substrate to which has been applied a layer of homopolymer or copolymer having an average molecular weight of at least 2000 and which contains at least 5 mole %, relative to the polymer, of at least one structural element of the formula I or II



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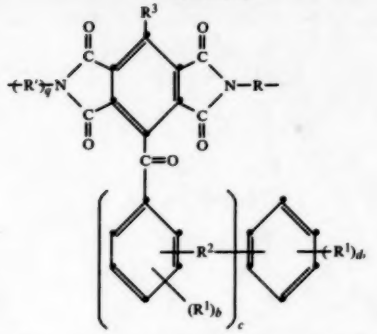
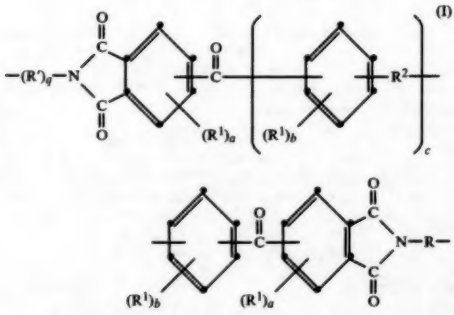


(II)

in which R^1 is halogen, nitro or C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio, each of which can be substituted by phenyl, or is phenyl, phenoxy or phenylthio, R^2 is a direct bond, —O—, —S—, —CH_2—, ethylidene, 2,2-propylidene or —CO—, R^3 is a hydrogen atom or aroyl or is as defined for R^1, a is 0, 1, 2 or 3, b is 0, 1, 2, 3 or 4, c and d are 0, 1, 2, 3, 4 or 5 and q is 0 or 1, and R and R′ are a substituted or unsubstituted divalent aliphatic radical which can be interrupted by hetero-atoms or by aromatic, heterocyclic or cycloaliphatic groups, or are a substituted or unsubstituted, cycloaliphatic or araliphatic radical, an aromatic radical in which two aryl nuclei are linked via an aliphatic group, or an aromatic radical which is substituted by at least one alkyl group, cycloalkyl group, alkoxy group, alkoxyalkyl group, alkylthio group, alkylthioalkyl group or aralkyl group, or two adjacent C atoms of the aromatic radical are substituted by an alkylene group, R being an aromatic radical which is substituted in the two ortho-positions relative to at least one N atom of two adjacent C atoms of the aromatic radical are substituted by alkylene, if q is 0.

11. A process for the preparation of a photographic relief image which comprises

irradiating with high-energy radiation imagewise through a photomask a coated material composed of a substrate to which has been applied a layer of homopolymer or copolymer, having an average molecular weight of at least 2000 and which contains at least 5 mole %, relative to the polymer, of at least one structural element of the formula I or II



(I)

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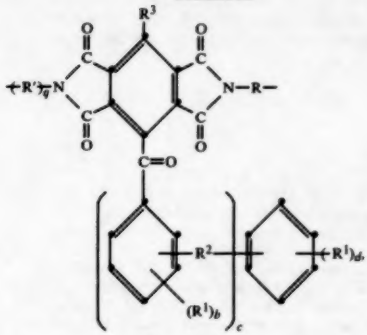


(II)

in which R^1 is halogen, nitro or C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio, each of which can be substituted by phenyl, or is phenyl, phenoxy or phenylthio, R^2 is a direct bond, —O—, —S—, —CH_2—, ethylidene, 2,2-propylidene or —CO—, R^3 is a hydrogen atom or aroyl or is as defined for R^1, a is 0, 1, 2 or 3, b is 0, 1, 2, 3 or 4, c and d are 0, 1, 2, 3, 4 or 5 and q is 0 or 1, and R and R′ are a substituted or unsubstituted divalent aliphatic radical which can be interrupted by hetero-atoms or by aromatic, heterocyclic or cycloaliphatic groups, or are a substituted or unsubstituted, cycloaliphatic or araliphatic radical, an aromatic radical in which two aryl nuclei are linked via an aliphatic group, or an aromatic radical which is substituted by at least one alkyl group, cycloalkyl group, alkoxy group, alkoxyalkyl group, alkylthio group, alkylthioalkyl group or aralkyl group, or two adjacent C atoms of the aromatic radical are substituted by an alkylene group, R being n aromatic radical which is substituted in the two ortho-positions relative to at least one N atom or two adjacent C atoms of the aromatic radical are substituted by alkylene, if q is 0, and then removing the unexposed portions with a developer.

4,680,196

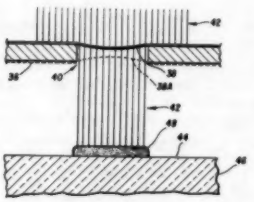
METHOD FOR SHADOW MASK PROTECTION DURING MANUFACTURE

Leonard Dietch, Skokie, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 768,522, Aug. 22, 1985. This application Apr. 15, 1986, Ser. No. 852,067

Int. Cl.[4] **B05D** *5/12*

U.S. Cl. 427—68 **4 Claims**



1. For use in the manufacture of a color cathode ray tube having a shadow mask with a pattern of minute apertures, a method for preventing particle occlusion of the apertures during manufacture comprising applying a removable film to at least one side of said mask prior to the mask-related CRT manufacturing operation which would expose the mask to dust

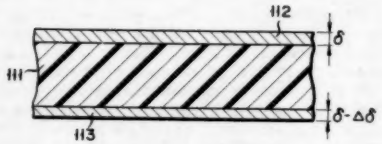
particles, and subsequently removing said film, said film having a small, substantially uniform thickness dimensions, a low index of refraction, and high transparency so as to exhibit a negligible optical effect during photoscreening operations.

4,680,197

METHOD OF MANUFACTURING PERPENDICULAR MAGNETIC RECORDING FLOPPY DISK

Masayuki Sagoi, and Reiji Nishikawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 711,713, Mar. 14, 1985, abandoned, which is a division of Ser. No. 505,480, Jun. 17, 1983. This application Dec. 2, 1985, Ser. No. 803,337
Claims priority, application Japan, Jun. 25, 1982, 57-109528
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—129 8 Claims



1. A method of manufacturing a perpendicular magnetic recording floppy disk comprising the steps of:

forming a first magnetic recording layer by sputtering a perpendicularly magnetizable material on one side of a plastic film substrate; and

forming a second magnetic recording layer by sputtering said perpendicularly magnetizable material on the other side of said plastic film substrate, after forming said first magnetic recording layer, said second magnetic recording layer having a thickness greater than that of said first magnetic recording layer when a curl of the first magnetic recording layer on the plastic film substrate, resulting from forming the first magnetic recording layer on the plastic film substrate, is to the outside with respect to said first magnetic recording layer.

4,680,198

METHOD OF PRODUCING A SCRATCH RESISTANT COATING ON A SHEET OF THERMOPLASTIC MATERIAL

Julius-Ludwig Herczeg, Bolligen; Martin Lenhard, Ittigen, and Ernst Flückiger, Toffen, all of Switzerland, assignors to Gurit-Worbla AG, Ittigen, Switzerland

Filed Jul. 11, 1985, Ser. No. 753,862
Claims priority, application Switzerland, Jul. 13, 1984, 3412/84
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—164 7 Claims

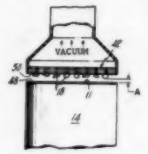
1. In a method of producing a scratch resistant coating on a sheet of thermoplastic material comprising the steps of applying a three-dimensionally crosslinkable resin to the sheet, curing and subjecting the coated sheet, after the curing of the resin, to the action of heat and uniform area pressure between polished surfaces to obtain an optically smooth surface of the coating.

4,680,199

METHOD FOR DEPOSITING A LAYER OF ABRASIVE MATERIAL ON A SUBSTRATE

John H. Vontell, Manchester, and Roscoe A. Pike, Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1986, Ser. No. 842,591
Int. Cl.[4] B05D *1/12*
U.S. Cl. 427—199 7 Claims



1. A method for depositing a single layer of particles on the surface of an article, wherein the particles are spaced apart from each other on said surface in substantially noncontacting relation in a desired pattern, comprising the steps of:

(a) drawing a suction through transfer tool means having a plurality of apertures spaced apart from each other in said desired pattern while the tool means is adjacent to a container of the particles, wherein the suction holds one particle over each aperture.

(b) applying and adhesive to the surface of the article,

(c) positioning the article relative to the apertures such that each particle substantially overlies its desired location on the article surface; and

(d) adjusting the suction such that the particles are released from the tool means and drop onto the article surface to form said desired pattern, wherein the particles are held to the article surface by the adhesive.

4,680,200

METHOD FOR PREPARING COLLOIDAL SIZE PARTICULATE

Jitka Solc, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1985, Ser. No. 757,238
Int. Cl.[4] B01J *13/02*
U.S. Cl. 427—213.34 6 Claims

1. A method for preparing a colloidal size particulate comprising the steps of (1) emulsifying a hydrophobic, emulsion polymerizable monomer in an aqueous colloidal dispersion of essentially water-insoluble organic solid particles that have not been pretreated with polymer, acid or other conventional anchoring agents, said dispersion being maintained with a surfactant and/or emulsifier, and (2) subjecting the resulting emulsion to emulsion polymerization conditions to form a stable, fluid aqueous colloidal dispersion of the particulate wherein essentially every organic solid particle is coated with the hydrophobic polymer resulting from said polymerization such that substantially all of the organic particles are maintained in a discrete spaced apart relationship to each other by the hydrophobic polymer.

4,680,201

COATING FOR ELECTROPHORESIS TUBE

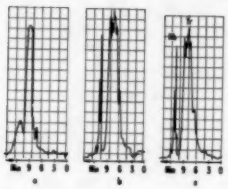
Stellan Hjerten, Institute of Biochemistry, University of Uppsala Biomedical Center, P.O. Box 576, S-751 23, Uppsala, Sweden

Filed Oct. 30, 1985, Ser. No. 792,724
Int. Cl.[4] B05D *7/22*
U.S. Cl. 427—230 6 Claims

1. A method for preparing a thin-wall, narrow-bore capillary

tube for use in electrophoretic separation, said method comprising:

contacting a solution of a monomeric bifunctional compound with the inside of the tube, where the bifunctional compound includes a first functional group capable of covalent attachment to the tube wall and a second functional group capable of polymerization to form a monomolecular coating;



washing the tube free of non-bound monomeric bifunctional compound; and

introducing free monomer to the inside of the tube in order to react the covalently bound monomeric second functional group with free monomer to form a monomolecular polymeric coating.

4,680,202

FABRIC FINISH WITH ALPHA OLEFIN RESINS AND PROCESS

E. Michael Coyle; Fred J. Reichley; Calvin J. Verbrugge, and John G. Villarreal, all of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 802,631, Nov. 27, 1985, which is a division of Ser. No. 659,979, Oct. 12, 1984, Pat. No. 4,623,683. This application Apr. 8, 1986, Ser. No. 849,592

Int. Cl.[4] B32B *9/00*

U.S. Cl. 427—389.9 **8 Claims**

1. A process for imparting a fabric finish to a textile material which comprises:

(a) impregnating said textile material with an aqueous fabric finishing composition comprising a solubilized polymer of from about 40 to 51 mole percent of at least one 1-alkene having at least 10 carbon atoms and from about 60 to 49 mole percent of maleic anhydride; and

(b) fixing said composition as a film on said textile material employing elevated heat and pressure.

4,680,203

PROTECTIVE COATING ON CONCRETE CONSTRUCTION

Hirohisa Maki, Neyagawa, and Katsuaki Matsuo, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed May 13, 1986, Ser. No. 862,877

Claims priority, application Japan, May 13, 1985, 60-101752; May 22, 1985, 60-111000; Jun. 3, 1985, 60-121050; Jul. 31, 1985, 60-170060

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—393.6 **7 Claims**

1. A method of forming a protective coating on concrete or mortar construction which comprises coating said construction with a polyurethane coating composition comprising;

(A) a polyol component having an average hydroxyl number from 30 to 450 mg KOH/g, at least 5 equivalent % of which is a polyol having a backbone chain consisting solely of carbon atoms or a mixture of said polyol component and a polyamine component having the sum of average hydroxyl number and average amine number of from 30 to 450 mg KOH/g; and

(B) an organic polyisocyanate curing agent, the porportion of said component (B) in terms of the NCO equivalent thereof relative to the active hydrogen equivalent of said component (A) being from 0.6 to 1.5.

4,680,204

COLOR PLUS CLEAR COATING SYSTEM UTILIZING INORGANIC MICROPARTICLES

Suryya K. Das; Jerome A. Seiner, both of Pittsburgh; Paul P. Greigger, Allison Park; James E. Jones, Lower Burrell; Raymond F. Schappert, Glenshaw, and William G. Boberski, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 783,324, Oct. 2, 1985, which is a continuation of Ser. No. 529,420, Sep. 6, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 879,767

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—407.1 **26 Claims**

1. A method of coating a substrate comprising the steps of:

(A) coating a substrate with one or more applications of a basecoating composition comprising:

(1) an organic film-forming resin, and where the film-forming resin can be crosslinked, optionally a crosslinking agent for the film-forming resin,

(2) substantially colorless, substantially inorganic microparticles of silica stably dispersed in the basecoating composition, the microparticles of silica prior to incorporation in the basecoating composition ranging in size from about 1 to about 150 nanometers wherein the silica is in the form of a stable colloidal dispersion of the silica in water, and wherein the inorganic microparticles are present in the basecoating composition in an amount ranging from about 1 to about 30 percent by weight based on the weight of organic film-forming resin, optional crosslinking agent, and inorganic microparticles,

(3) an aqueous solvent system for the film-forming resin, and

(4) pigment particles

to form a basecoat; and

(B) coating the basecoat with one or more applications of a topcoating composition comprising:

(1) an organic film-forming resin, which may be the same as or different from the film-forming resin of the basecoating composition, and where the film-forming resin of the topcoating composition can be crosslinked, optionally a crosslinking agent for the film-forming resin of the topcoating composition, and

(2) a solvent system for the organic film forming resin of the topcoating composition

to form a transparent topcoat.

4,680,205

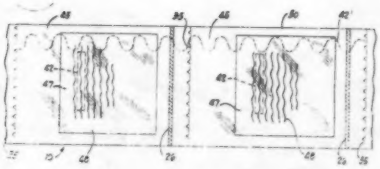
CONTINUOUS WEB REGISTRATION

Hershey Lerner, Hudson, and Bernard Lerner, Peninsula, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 378,428, May 14, 1982, abandoned, which is a continuation of Ser. No. 166,500, Jul. 7, 1980, abandoned. This application Sep. 12, 1983, Ser. No. 531,424

Int. Cl.[4] B44F *1/10*

U.S. Cl. 428—29 **27 Claims**



1. An elongated web comprising:

(a) a pair of plies in face-to-face relationship with one another;

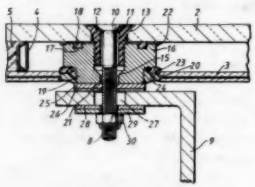
(b) a visible coating on at least one surface of at least one of the plies;
(c) said coating being in the form of a repetitive pattern to provide a series of separable web sections;
(d) the web including a series of spaced, transversely disposed, portions delineating the ends of the sections;
(e) each of the sections being adapted for separation from the web to provide a commodity substantially identical to commodities formed by separation of the other of the web sections; and
(f) normally invisible, registration enabling indicia on at least one of the plies, the indicia on stimulation by radiation of a given intensity emitting wave shifted electromagnetic radiation of significantly different intensity than that radiated or refelected by the coating and the web plies upon exposure to a given intensity of electromagnetic radiation of a certain wavelength range even though the wave shifted and the radiated or reflected radiations may include radiation of substantially identical wavelengths.

4,680,206

SEALED DOUBLE GLAZING UNIT

Brian Yoxon, Hoole, and William Thilwind, Windle, both of England, assignors to Pilkington Brothers P.L.C., St. Helens, England

Filed Feb. 11, 1986, Ser. No. 828,271
Claims priority, application United Kingdom, Feb. 19, 1985, 8504275
Int. Cl.[4] E06B *3/24*
U.S. Cl. 528—34 **18 Claims**



1. A sealed double glazing unit comprising: an outer pane and an inner pane which are spaced apart by perimeter sealing means, and at least one fixing means for fixing the unit to a supporting member, which fixing means is attached to one of said panes inwardly of said perimeter sealing means without obstructing the outer edge of the unit, said fixing means being operable to permit the unit to flex under wind load without impairing the sealing of the unit by said perimeter sealing means.

4,680,207

THERMOPLASTIC SACK

Charles R. Murray, Toronto, Canada, assignor to C-I-L Inc., North York, Canada

Filed Jul. 23, 1986, Ser. No. 888,569
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—35 **13 Claims**

1. A thermoplastic shipping sack having walls comprising a cold-drawn unbalanced biaxially oriented linear low density polyethylene film having a transverse direction draw ratio selected from greater than 1 to less than 3 and a machine

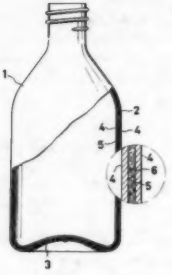
direction draw ratio of less than 6 but greater than the transverse direction draw ratio.

4,680,208

BIAXIALLY ORIENTED PLASTIC CONTAINER WITH EXCELLENT HEAT-RESISTANCE AND GAS BARRIER PROPERTIES

Daiichi Aoki; Yoshinori Nakamura; Hiroyuki Orimoto, and Kazumi Machida, all of Sakakimachi, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Filed Feb. 28, 1985, Ser. No. 706,474
Claims priority, application Japan, Mar. 2, 1984, 59-40071
Int. Cl.[4] B27N *5/02*; B65D *23/00*
U.S. Cl. 428—35 **2 Claims**



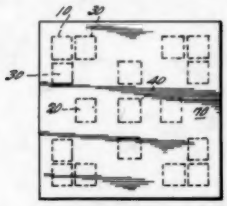
1. In a biaxially oriented container having three layers in section obtained by concentrically injecting two kinds of plastics into a cavity to mold a bottomed parison and stretch-blow molding said parison to form said biaxially oriented container with excellent heat-resistance and gas barrier properties, an intermediate layer of said container being formed of plastic containing selected lengths of glass fiber; said glass fiber having a length of 1–4 mm and being present in a percentage of 0.5–3.0 percent by weight with respect to said plastic which forms said intermediate layer, said plastic material of said intermediate layer being selected from the group consisting of polyethylene terephthalate, saponified ethylene-vinylacetate copolymer, ethylene-vinylalcohol copolymer, and m-xylene-type polyamide.

4,680,209

SELF STICKING CARPET TILES

Walter C. Zybko; William Wald, and Thomas V. McClure, all of Lexington, Va., assignors to Burlington Industries, Inc., Greensboro, Md.

Continuation-in-part of Ser. No. 837,352, Mar. 7, 1986, which is a continuation-in-part of Ser. No. 712,035, Mar. 15, 1985, Pat. No. 4,617,210. This application Jul. 14, 1986, Ser. No. 884,929
Int. Cl.[4] B32B *7/14;* D04H *1/08*
U.S. Cl. 428—35 42 Claims



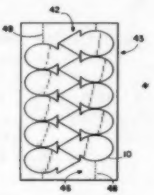
1. A tile system comprising a plurality of tiles having adhesive and non-stick material on the backs thereof, said adhesive being provided for adhering said tiles to a surface, being non-releaseably applied to said backs and having release properties as to surface other than those covered with adhesive, said adhesive and said non-stick material being arranged on said backs such that two of said plurality of tiles may be placed in back-to-back contact so that the adhesive on one tile will contact the non-stick material on the other tile and vice versa, whereby said two tiles in back-to-back contact may be readily separated from one another.

4,680,210

REPOSITIONABLE DIRECTIONAL MARKERS

Dan E. Corcoran, 4640 Scenic Ave., Central Point, Oreg. 97502

Filed May 12, 1986, Ser. No. 862,108
Int. Cl.[4] B32B *7/06*
U.S. Cl. 428—42 8 Claims



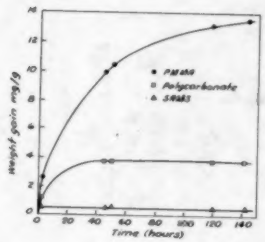
1. A stationary product comprising:
(a) a sheet of stock;
(b) an elongate adhesive strip of releasable, reusable adhesive arranged on said stock;
(c) said stock including an array of discrete elongate directional markers formed therefrom, said markers arranged substantially perpendicular to said elongate strip;
(d) each of said markers including a directional portion proximate one end, said directional portions of said markers arranged on said adhesive strip;
(e) each of said markers in said array including a non-directional portion, said non-directional portions of said markers in said array defining a pair of elongate rows parallel to and on either side of said adhesive strip; and
(f) said directional portions of said markers are arranged adjacent to each other and intermesh with, and point in the opposite direction from, said adjacent directional portions.

4,680,211

RECORDING DISKS

Thomas E. Evans, and Christine M. Bowen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1985, Ser. No. 758,904
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—65 8 Claims



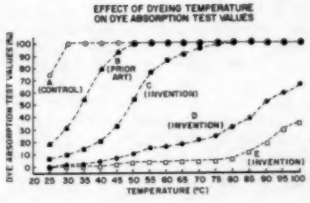
1. A recording disk adapted for the magnetic or optical recording or retrieval of information comprising a copolymer of at least one vinyl aromatic monomer and alpha-methylstyrene prepared by anionically polymerizing the vinyl aromatic monomer and alpha-methylstyrene at a temperature greater than about 61° C. and less than the ceiling temperature of the vinyl aromatic monomer.

4,680,212

STAIN RESISTANT NYLON FIBERS

Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Oct. 2, 1986, Ser. No. 914,507
Int. Cl.[4] B32B *27/34*
U.S. Cl. 428—97 28 Claims



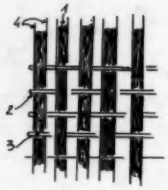
1. An undyed stain resistant nylon fiber characterized by having a coating on the surface thereof comprising one or more stain blockers in an amount sufficient to provide a fiber having a dye absorption test value at 25° C. of no greater than 7% and a dye absorption value at 100° C. of no less than 30%.

4,680,213

TEXTILE REINFORCEMENT USED FOR MAKING LAMINATED COMPLEXES, AND NOVEL TYPE OF LAMINATE COMPRISING SUCH A REINFORCEMENT

André Fourezon, Mariac, France, assignor to Etablissements les fils d'Auguste Chomarat et Cie, Paris, France

Filed Mar. 25, 1986, Ser. No. 844,010
Claims priority, application France, Apr. 4, 1985, 85 05346
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—105 9 Claims



1. A textile reinforcement matrix for making laminated complexes comprising:

at least one layer of reinforcing yarns, said reinforcing yarns being arranged in a parallel relationship in said at least one layer to form strips, said strips having first and second edges and being spaced apart from one another;

at least one layer of first binding yarns disposed transversely across said at least one layer of reinforcing yarns, and being present in a lesser amount than said reinforcing yarns; and

at least one second binding yarn disposed in a parallel relationship with said strips of reinforcing yarns, said at least one second binding yarn being positioned along said first and second edges of each of said strips of reinforcing yarns, said at least one layer of first binding yarns and said at least one second binding yarn defining stable and non-deformable holes having a definite shape.

4,680,214

REINFORCED FOAM COMPOSITES

Kurt C. Frisch, Grosse Ile, and Kaneyoshi Ashida, Farmington Hills, both of Mich., assignors to Polymetrics Corporation, Monroe, Mich.

Filed Mar. 12, 1986, Ser. No. 838,942
Int. Cl.[4] B05D 5/12
U.S. Cl. 428—107 20 Claims

1. A high-density foam formed by foaming with an amount of foaming agent such that the density is at least twenty pounds per cubic foot, a foam composition comprising:

(A) a foam-forming organic polyisocyanate component having a functionality of greater than two;

(B) a multi-polyol component, constituent polyols of which comprise a rigid polyol having an equivalent weight between about 100 and about 160, a hydroxyl number of about 250 to about 800, and a functionality of at least four; an aromatic polyester polyol having an equivalent weight between about 100 and about 400, a hydroxyl number of about 150 to about 600, and a functionality of 2 to 3; and a flexible polyol having an equivalent weight between about 1000 and about 2500, a hydroxyl number between about 25 and 60, and a functionality of not greater than three;

said constituent polyols being in the proportions of about 50 to about 75 parts rigid polyol, about 20 to about 50 parts aromatic polyester polyol, and about 1 to about 20 parts flexible polyol in a total amount of 100 parts;

(C) a catalyst selected from the group consisting of urethane catalysts, trimerization catalysts, and mixtures thereof; said urethane catalyst being an essential component when the isocyanate index is between about 100 and about 115 and said trimerization catalyst being an essential component when the isocyanate index is between about 125 and about 500; and the isocyanate component (A) and the polyol component (B) being in proportions which give an isocyanate index between about 100 and about 500; and

(D) a surfactant suitable for use in urethane foams;

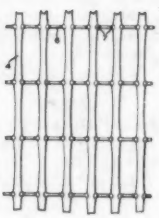
said constituent polyols being compatible so that the admixture thereof is substantially homogeneous at the foaming temperature and has a consistency such that fillers and reinforcing fibers can be suspended therein in an amount of about 10 to about 50 percent based on the total weight of the composition.

4,680,215

MESH STRUCTURE AND LAMINATE MADE THEREWITH

Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England

Division of Ser. No. 765,186, Aug. 13, 1985, Pat. No. 4,618,385, which is a continuation of Ser. No. 510,252, Jul. 1, 1983, abandoned. This application Aug. 6, 1986, Ser. No. 893,826
Claims priority, application United Kingdom, Jul. 6, 1982, 8219477
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—107 10 Claims



1. An integral, biaxially-molecularly-orientated mesh structure, comprising:

continuous, substantially parallel, molecularly-uniaxially-orientated main strands with the orientation therein extending substantially uniformly from end to end and generally parallel to said main strands, said main strands being of substantially rectangular cross-section with their width substantially greater than their thickness; and

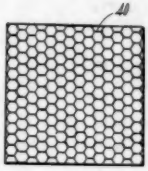
discontinuous, uniaxially-molecularly-orientated interconnecting strands with the orientation therein extending generally parallel to the direction of said interconnecting strands, said interconnecting strands extending in a direction generally at right angles to said main strands and interconnecting said main strands at a plurality of positions spaced along the edge of each said main strand, each said interconnecting strand being generally symmetrical about a line at right angles to said main strands, to thereby define a generally regular mesh structure having generally four-sided mesh openings, each said mesh opening being defined by two said main strands and two said interconnecting strands, and the cross-sectional area at the midpoints of said interconnecting strands being less than the minimum cross-sectional area of said main strands;

there being adjacent each end of each said interconnecting strand a zone of plastics material which is thicker than the material of the remainder of the respective said interconnecting strand.

4,680,216
METHOD FOR STABILIZING THICK HONEYCOMB CORE COMPOSITE ARTICLES

Gary J. Jacaruso, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,308
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 2 Claims



1. A method of making a fiber reinforced composite article having a honeycomb core wherein the honeycomb core has a thickness greater than one inch, comprising:

bonding a layer of resin impregnated, woven, continuous graphite fibers to one of the open-cell surfaces of the honeycomb core,

curing the resin thereby stabilizing the honeycomb core,

cutting the stabilized honeycomb core to net shape,

laying up one or more layers of reinforced matrix material onto the shaped, stabilized honeycomb,

heating under vacuum and pressure to cure the resin matrix resulting in a honeycomb core containing composite with the honeycomb core having substantially retained its pre-bonded shape.

4,680,217
POLYESTER FILM FOR MAGNETIC RECORDING MEDIA

Tateo Kanesaki, Nagahama; Shigeo Utsumi, Yokohama, and Kichinojyo Tomitaka, Kawasaki, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 818,920, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 599,333, Apr. 12, 1984. This application Oct. 3, 1986, Ser. No. 914,582
Claims priority, application Japan, May 2, 1983, 58-77928
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—141 1 Claim

1. A polyester film for magnetic recording media having excellent flatness, slipperness and ability to retain a magnetic layer applied thereto, said film having minute protrusions on the surface thereof including roughness units each of which consists of a minute protrusion and a recess therearound having a longer diameter of at least 3 μm, wherein the number of said roughness units per square mm, A, (number/1 mm^2), satisfies the relation (1):

$$10<A\leqq 1400 \quad (1);$$

the proportion of the number of the roughness units to the total number of the protrusions B (%) satisfies the relation (2):

$$5\leqq B\leqq 30 \quad (2);$$

the center line average roughness R_a (μm) ranges from 0.013 to 0.019 and the number of secondary interference fringes, H_2 (number/1 mm^2), measured by the multiple interference method ranges from 9 to 40; the ratio of the peak value of the (1 $\bar{1}$ 0) face measured by X-ray diffractometry to the peak value of the (1 0 0) face satisfies the relation (4):

$$0.10\leqq I\,(1\ \bar{1}\ 0)/I(1\ 0\ 0)\leqq 0.21 \quad (4);$$

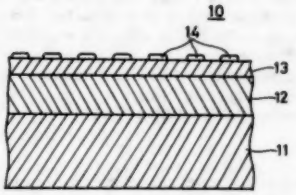
and the difference between the maximum thickness and the minimum thickness R (μm) and the average thickness of the film $\bar{x}$ (μm) satisfies the relation (5);

$$R/\bar{x}<0.10 \quad (5).$$

4,680,218
MAGNETIC RECORDING MEDIUM

Akihiro Kimura, Sagamihara; Toshio Ando, Fujisawa, and Toshikazu Nishihara, Zama, all of Japan, assignors to Victor Company of Japan, Japan

Filed Sep. 23, 1985, Ser. No. 779,160
Claims priority, application Japan, Sep. 29, 1984, 59-202963; Sep. 29, 1984, 59-202964
Int. Cl.[4] G11B *5/64, 5/72*
U.S. Cl. 428—195 7 Claims



1. A magnetic recording medium comprising:

a base;

a magnetic layer formed on the base, said magnetic layer being made of a magnetic material;

a lubricant layer formed on the magnetic layer, said lubricant layer being made of a lubricant material having lubricity; and having a thickness in a range of approximately 5 nm to 200 nm; and

a corrosion resisting layer formed on the lubricant layer, said corrosion resisting layer being made of a corrosion resisting material having corrosion resistance and being distributed locally on said lubricant layer so that at least a part of said lubricant layer is exposed, said corrosion resisting layer having a thickness in a range of approximately 1 nm to 7 nm.

4,680,219
MOLDABLE FIBROUS SHEET AND A METHOD FOR MANUFACTURING SAME

Michel Vernois, Courbevois, and Francois Paugam, Casteljaloux, both of France, assignors to Isoroy, Lisieux, France

Filed Mar. 19, 1985, Ser. No. 713,744
Claims priority, application France, Mar. 20, 1984, 84 04308
Int. Cl.[4] D03D *13/00*
U.S. Cl. 428—222 8 Claims

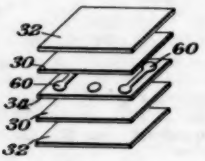
1. A moldable fibrous sheet formed by superimposing fine layers, said sheet having a cellulose fiber and textile fiber base, and having a composition comprising from 5 to 95% by weight of cellulose fibers obtained by dry shredding, from about 0.5 to 10% of undulated textile fibers having at least two half-waves of undulation per centimeter of length said undulated fibers by virtue of their undulation of at least two half-waves per container of length being mechanically bonded to other fibers in the sheet, said fine layers being sewn but not rigidly connected to each other.

4,680,220

DIELECTRIC MATERIALS

Daniel D. Johnson, Yorklyn, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 26, 1985, Ser. No. 705,538
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—241 35 Claims



1. A dielectric material comprising a fabric having fibers and interstices between said fibers, in which at least a portion of the fibers in said fabric are treated fluorocarbon fibers, such treatment making the fluorocarbon fibers wettable by an uncured thermosetting resin, the fabric being impregnated within said interstices between said fibers with a themosetting resin cured to at least the semi-cured, B-stage state, the dielectric constant of said dielectric material being less than 3.5.

4,680,221

CHEMICAL-RESISTANT FILTER MATERIAL

Sadamitsu Murayama, Takatsuki, and Makoto Tanaka, Toyonaka, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 23, 1985, Ser. No. 812,319
Claims priority, application Japan, Dec. 25, 1984, 59-271843
Int. Cl.[4] B01D 39/04, 39/08, 39/16
U.S. Cl. 428—246 14 Claims

1. A chemical resist filter material comprising a fibrous structure made of organic fibers, the fiber surface of which is coated with at least one inorganic oxide selected from the group consisting of oxides of silicon, aluminum and lithium.

4,680,222

PROCESS AND DEVICE FOR ELECTRIC WINDING INSULATION BY IMPREGNATION, AND STABILIZED VARNISH WITHOUT SOLVENT USABLE THEREIN

Alain Anton, Chaponnay, France, assignor to Alsthom-Atlantique, S.A., Paris Cedex, France

Filed Jul. 13, 1984, Ser. No. 630,598
Claims priority, application France, Jul. 13, 1983, 83 11723
Int. Cl.[4] H01B 3/04, 3/08, 3/40, 17/60
U.S. Cl. 428—251 14 Claims

1. A process of insulating a winding of electrical conductors with isocyanurate and oxazolidone cycle resins, the process comprising wrapping around the conductors a glass cloth and porous mica paper tape loaded with a quaternary ammonium salt for catalyzing the condensation of isocyanate and epoxy compounds, impregnating the tape with a solvent-free varnish containing an isocyanate compound and a liquid epoxy resin, and then subjecting the impregnated tape to a varnish polymerization thermal treatment, wherein said quaternary ammonium salt is a benzyl-trialkylammonium halide with an alkyl chain containing 3 carbon atoms at the most.

11. An insulation device formed by impregnation of an electric winding, including a glass cloth and porous mica paper tape loaded with a quaternary ammonium salt catalyzing the condensation of isocyanate and epoxy compounds into isocyanurate and oxazolidone cycles, with a solvent-free varnish made from an isocyanate compound and a liquid epoxy resin, and hardened by thermal treatment in the presence of the quaternary ammonium salt, characterized in that the quaternary ammonium salt is a benzyl-trialkylammonium halide with an alkyl chain containing at the most 3 carbon atoms.

4,680,223

FIBROUS INNER WEB FOR SHEET VINYL FLOORING GOODS

Peter G. Bither, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 22, 1985, Ser. No. 801,106
Int. Cl.[4] D04H 1/08
U.S. Cl. 428—280 9 Claims

4. A fibrous web, useful as an inner layer in a multi-layer sheet floor covering material, prepared from a composition comprising

(a) from about 4% to about 15% woodpulp,
(b) from about 5% to about 10% glass fibers,
(c) from about 4% to about 15% polyolefin pulp containing carboxylic functionality,
(d) from 0 to about 5% polyolefin pulp devoid of carboxylic functionality,
(e) from about 30% to about 65% inorganic filler,
(f) from about 10% to about 15% thermoplastic polymeric binder, other than polyvinyl chloride, and
(g) from 0 to about 20% polyvinyl chloride,

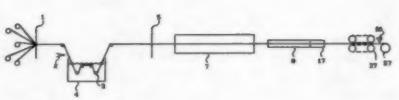
all percentages being by weight based on the total weight of the composition.

4,680,224

REINFORCED PLASTIC

James E. O'Connor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 584,418, Mar. 6, 1984, which is a continuation-in-part of Ser. No. 483,013, Apr. 7, 1983. This application Sep. 9, 1985, Ser. No. 773,965
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—294 14 Claims



1. A reinforced plastic comprising

(a) a roving of reinforcing material having unidirectionally aligned fibers in
(b) a poly(arylene sulfide) matrix.

4,680,225

MAGNETIC TAPE HAVING A LEADER TAPE

Hiroshi Ogawa; Chiaki Mizuno; Yasuo Tamai, and Koozi Kamiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1985, Ser. No. 750,358
Claims priority, application Japan, Jun. 29, 1984, 59-133010
Int. Cl.[4] G11B 5/627
U.S. Cl. 428—323 18 Claims

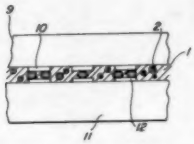
1. A magnetic tape having a leader tape comprising a coating layer provided on one or both sides of a support at least one end of said magnetic tape, characterized in that the coating layer contains, as predominant components, an electrically conductive powder having a mean grain size of 0.001 to 1 um and a volume resistance of 10^0 to 10^8 Ω-cm and being at least one member selected from the group consisting of SnO_2, In_2O_3, ZnO, $BaTiO_3$, and $SrTiO_3$ which have been modified to provide electrical conductivity and a binder and the leader tape has a percent photo-transmission of at least 20%.

4,680,226

HEAT SENSITIVE TYPE ADHESIVE CONNECTOR

Yoshio Takeda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1986, Ser. No. 821,965
Claims priority, application Japan, Jan. 28, 1985, 60-14952
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—327 14 Claims



1. A heat sensitive type adhesive connector for providing electrical connection between terminals disposed on base members comprising:

a sheet made of a heat sensitive resin-type adhesive material, for causing said base members to adhere together; and

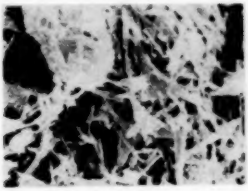
electrically conductive and elastic particles uniformly scattered in the sheet, for providing electrical connection between the terminals.

4,680,227

FIRE-RETARDING RESIN COMPOSITION AND LAMINATED PRODUCT THEREOF

Yoshiki Aoyagi, Yokohama; Masatoshi Suzuki, Fujisawa; Tadashi Inoue, Yokohama, and Kunio Tsukakoshi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,168
Claims priority, application Japan, Nov. 27, 1984, 59-249973; Dec. 19, 1984, 59-267891
Int. Cl.[4] B32B 5/16, 15/08
U.S. Cl. 428—331 7 Claims



1. A laminated product composed of a plurality of metal sheets; and a fire-retarding resin composition in a sheet form, said fire-retarding resin composition consisting essentially of 100 parts by weight of polyolefin resin, and 10 to 100 parts by weight of hydrate of calcium silicate containing therein 30% by weight or more of platy crystals and/or needle-shaped crystals with its aspect ratio of 3 or higher, said hydrate being in the form of powder granule composed of a secondary aggregate, in which said platy crystals and/or needle-shaped crystals are aggregated, and having its bulk density of 0.5 or lower, and said metal sheets being laminated on both surfaces of said fire-retarding resin sheet.

4,680,228

ADHESION OF RUBBER TO ARAMID CORDS

Satish C. Sharma, Mogadore, Ohio, assignor to GenCorp Inc., Akron, Ohio

Filed Mar. 3, 1986, Ser. No. 835,141
Int. Cl.[4] C08L 63/00; C09J 3/14
U.S. Cl. 428—378 24 Claims

1. A method for adhering a poly(p-phenylene terephthalamide) reinforcing element to a rubber compound which comprises (I) treating said element with a composition comprising an aqueous alkaline dispersion of from about 10 to 50%, by weight of solids comprising (a) at least one rubbery vinyl pyridine copolymer latex, (b) at least one water soluble or dispersible epoxide having an average of from about 2 to 4 epoxide groups per molecule and (c) a water soluble or dispersible polyfunctional amine curing agent selected from the group consisting of primary, secondary and tertiary amines and mixtures of said amines, (b) being used in an amount of from about 10 to 30 parts by weight per 100 parts by weight of (a) on a dry weight basis and (c) being used in an amount of from about 2 to 8 parts by weight per 100 parts by weight of (a) on a dry weight basis, heating said treated element at a temperature of from about 200° to 600° F. for from about 300 to 5 seconds to remove essentially all of the water from said composition and to provide said element with a heat cured or heat set dry adhesive in an amount of up to about 20%, total by weight (dry) based on the weight of said reinforcing element, and (II) combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized vulcanizable rubber compound and vulcanizing the same.

4,680,229

FLAME-RESISTANT HYDROCARBON POLYMER COMPOUNDS, AND INSULATED ELECTRICAL PRODUCTS THEREOF

Joseph E. Betts, Westport, Conn., and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

Continuation of Ser. No. 516,609, Jul. 25, 1983, abandoned, which is a continuation of Ser. No. 285,655, Jul. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 816,854, Jul. 18, 1977, abandoned. This application Jul. 22, 1985, Ser. No. 737,357
Int. Cl.[4] B32B 15/00, 25/20
U.S. Cl. 428—389 17 Claims

1. An electrical conductor comprising a metallic conductive element having a halogen-free, flame-resistant, crosslink curable polyolefin polymer compound insulation thereabout comprising the following, in the approximate relative parts by weight of

Polyolefin	100
Organopolysiloxane gum	2–20
Organic Lead compound	1–15

11. An electrical conductor comprising a metallic conductor element having a halogen-free, flame-resistant, crosslink cured polyethylene compound insulation thereabout comprising the cured product of the following, in the approximate parts by weight of

Polyethylene	100
Organopolysiloxane gum	2–20
Dibasic lead phthalate	1–5
Fumed silica	1–6
Antioxidant	0–5
Antimony oxide	0–15
Organic peroxide curing agent	1–10

4,680,230

PARTICULATE CERAMIC USEFUL AS A PROPPANT

James L. Gibb, Woodbury, Minn.; James A. Laird, St. Joseph, Wis.; George W. Lee, St. Paul, and William C. Whitcomb, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1984, Ser. No. 571,739

Int. Cl.[4] B32B *5/16;* **C04B** *38/06;* **C09K** *3/00*

U.S. Cl. 428—403 **16 Claims**

1. A particulate fired ceramic made from raw materials which comprise about:

50–97 parts by weight of mineral particulates;

3–50 parts by weight alumina; and at least one part by weight binder; wherein the mineral particulates comprise a ceramic mineral which melts below about 1300° C., does not substantially sublime or volatilize below 1300° C., vitrifies upon cooling, and has a fired density of less than about 2.9 grams per cubic centimeter;

wherein the binder is characterized by adhering the mineral particulate and alumina powder together after pelletizing but before firing; and wherein the particulate ceramic itself is characterized by:

(i) an outer region of the particles which is rich in alumina concentration as compared to the region near the center of the particles; and

(ii) a fired density less than about 2.9 grams per cubic centimeter.

4,680,231

LOW-VELOCITY ELECTRON EXCITED PHOSPHOR

Tatsuo Yamaura, and Hisamitsu Takahashi, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Nov. 20, 1985, Ser. No. 800,034

Claims priority, application Japan, Nov. 28, 1984, 59-249707

Int. Cl.[4] C09K *11/50*

U.S. Cl. 428—407 **6 Claims**

1. Low-velocity electron excited phosphor comprising:

a phosphor material selected from the group consisting of Y_2O_2S:Eu; Y_2O_3:Eu; YVO_4:Eu; $(Zn_{1-x}Cd_x)S$:Ag $0.65<X\leqq0.9$; $Zn_3(PO_4)_2$:Mn; $Cd_2B_2O_5$:*Mn*; $Zn(S_{1-x}Se_x)$:Cu $0.05\leqq x\leqq0.6$; $Zn(S_{1-x}Se_x)$:Cu,Al $0.05\leqq x\leqq0.6$; $(Zn_{1-x}Cd_x)S$:Ag, Al $0.5<x\leqq0.7$; $(Zn_{1-x}Cd_x)S$:Au,Al $0\leqq x\leqq0.2$; $(Zn_{1-x}Cd_x)$:Cu $0.1<X\leqq0.2$; $(Zn_{1-x}Cd_x)S$:Cu,Al $0.1<x\leqq0.2$; $CaSiO_3$:Pb,Mn; $(Zn_{1-x}Cd_x)S$:Cu,Al $0\leqq x\leqq0.1$; $SrGa_2S_4$:Eu^{2+}; $Y_3(Al_{1-x}Ga_x)_5O_{12}$:Ce $0\leqq x\leqq0.5$; Zn_2SiO_4:Mn; Y_2O_2S:Tb; La_2O_2S:Tb; $(Zn_{1-x}Cd_x)S$:Ag $0.3\leqq x\leqq0.5$; ZnS:Au,Al; ZnS:Cu,Al; ZnS:Cu,AU,Al; Zn_2SiO_4:Mn,As; $(Zn_{1-x}Cd_x)S$:Cu $0\leqq x\leqq0.1$; $(Zn_{1-x}Cd_x)S$:Ag,Al $0.3\leqq x\leqq0.5$; ZnS:Ag; ZnS:Ag,Al; Zn(S,Se):Ag; Zn(S,Se):Ag,Al; Y_2SiO_5:Ce; $SrGa_2S_4$:Ce; Ca_2MgSiO_5:Ce; $(Ca,Mg)_2SiO_4$:Ti; $(Ba,Mg)O_2.6Al_2O_3$:Eu^{2+}; $(Sr,Ba)_3(PO_4)_2$:Eu^{2+} and $Ca_2B_5O_9Cl$:Eu^{2+}, said phosphor material being in the form of particles;

a conductive material selected from the group consisting of In_2O_3; SnO_2; ZnO; TiO_2; WO_3; Nb_2O_3; CdS; and Cu_2S, said conductive material being the form of fine particles having a particle distribution of which median is 0.1–2.4μ and a standard deviation of 0.7μ or less; and an organic binder

said conductive material of fine particles being deposited on the surface of said particles of said phosphor material by means of said organic binder which is either water-soluble or organic solvent-soluble.

4,680,232

ABRASION AND UV RESISTANT COATING COMPOSITIONS

Arnold Factor, Scotia, and Gautam A. Patel, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

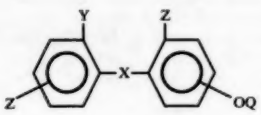
Filed Jan. 2, 1986, Ser. No. 815,614

Int. Cl.[4] B32B *9/04, 13/12, 27/36;* **C09K** *3/14*

U.S. Cl. 428—412 **14 Claims**

1. A UV stabilized coating composition comprising a water-/aliphatic alcohol solids dispersion of a partial condensate derived from organotrialkoxysilane and containing at least about 30 weight percent methyltrisilanol, and a colloidal dispersion of colloidal silica and a colloidal metal, colloidal metal alloy or colloidal metal salt, said metal being selected from the group consisting of antimony, aluminum, gold, silver, copper, tin, cadmium and indium, said dispersion comprising about 5 to 70 weight of the solid portion of the coating composition,

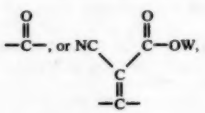
and an effective amount of a silylated ultraviolet light absorbing agent capable of co-reacting with the organotrialkoxysilane and having the formula



I

wherein

X is



Y is H or OH; Z is H, OH, OQ or OW, where at least one Z in the ortho position is OH if Y is H; Q is $—CH_2(CH_2)_nSi(R'')_x(OR''')_y$ and W is $—C_mH_{2m+1}$

where x is 0, 1 or 2, y is 1, 2 or 3, $x+y=3$, $n=0$, 1 or 2, $m=1$ to 18, R'' is alkyl having 1 to 6 carbon atoms and each R''' is independently selected from the group consisting of alkyl or alkanoyl having 1 to 6 carbon atoms.

12. A solid substrate having at least one surface coating with a cured composition of claim 1.

13. A solid substrate as in claim 12 which comprises polycarbonate.

4,680,233

SEALING MATERIAL

Geary E. Camin, Los Altos, and William D. Uken, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 2, 1985, Ser. No. 730,405

Int. Cl.[4] B32B *27/40*

U.S. Cl. 428—424.6 **21 Claims**

1. A sealing material comprising in combination:

a. an elastomeric sealant comprising a polysiloxane, a polyurethane, a polybutyl or a triblock copolymer and having a cone penetration from about 100–350 (10^{-1} mm) and an ultimate elongation of at least 50%; and

b. a backing material disposed on a surface of the elastomeric sealant comprising an air drying or air curing material which is liquid, dissolved in a solvent or dispersed in a carrier and which, when dried or cured, sufficiently adheres to the surface of the elastomeric sealant and provides means for installation of the elastomeric sealant on a substrate and which reduces the surface tack of the elastomeric sealant.

4,680,234

WEATHERABLE COEXTRUDED FLEXIBLE FILMS AND LAMINATED STRUCTURE

Robert H. Kelch, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1985, Ser. No. 732,981
Int. Cl.[4] B32B *15/08, 27/00*
U.S. Cl. 428—461 10 Claims

1. A coextruded flexible film particularly adapted for use as a weatherable surface coating by lamination to a substrate having a first layer comprising a blend of a vinyl chloride polymer, an interpolymer comprising ethylene and at least one carboxylic acid or ester thereof containing ethylenic unsaturation, and a chlorinated polyolefin and a second layer comprising a normally solid thermoplastic adhesive comprising an interpolymer of an olefin and at least one copolymerizable comonomer selected from the group consisting of carboxylic acids and esters thereof having ethylenic unsaturation.

4,680,235

RECORDING MATERIAL FOR INK JET PRINTING

Kakuji Murakami, Shizuoka; Eiichi Akutsu, Ichikawa, and Tamotsu Aruga, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,873
Claims priority, application Japan, Mar. 23, 1984, 59-54314
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—414.4 13 Claims

1. An ink jet recording material for forming images thereon with an ink composition by ink jet printing comprising a nonporous base material and a surface recording layer formed thereon, said surface recording layer containing a surface active agent selected from the group consisting of anionic and cationic surface active agents which does not form a material insoluble in said ink composition when contacted with a dye contained in said ink composition, and a binder agent which is soluble or swells in an aqueous ink.

4,680,236

ELECTRODELESS HETEROGENEOUS POLYPYRROLE COMPOSITE

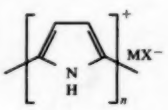
Ronald E. Myers, Strongsville, and Ephraim Buhks, North Royalton, both of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

Filed Feb. 18, 1986, Ser. No. 830,299
Int. Cl.[4] B32B *27/08;* H01B *1/06*
U.S. Cl. 428—515 6 Claims

1. A conductive composite consisting essentially of

(i) a normally insulating host polymer having an arbitrary shape and sufficient thickness to have heterogeneously deposited, on and within said polymer, for a depth of at least 1 micron,

(ii) a first poly(2,5-pyrrole) ("PP") species in combination with a counterion of a Group VIII metal halide represented by the structure



wherein,

n is an integer in the range from 2 to about 1000;

M represents a Group VIII metal selected from the group consisting of iron, nickel, and cobalt; and,

X represents chlorine, or bromine; so that there is one MX^- anion for each repeating unit consisting of from 3 to about 10 connected pyrrole rings, said combination of first species of PP and counterion being present in an amount sufficient to form a semiconductive composite; and,

(iii) a conductive species electrodeposited on said semiconductive composite in an amount sufficient to increase the conductivity of said semiconductive composite.

4,680,237

COLORED FLOOR FINISH

Michael T. Kenney, 29055 S.W. Parkway, Space A., and Jeffrey S. Rhoades, 28900 S.W. Parkway, No. 14, both of Wilsonville, Oreg. 97070

Filed Feb. 7, 1986, Ser. No. 827,089
Int. Cl.[4] B32B *27/08;* B05D *3/02*
U.S. Cl. 428—520 14 Claims

1. A method of placing colored indicia or tints on a porous surface, the method comprising the steps of:

forming a base layer by applying an unpigmented metal interlock acrylic finish to said surface; and

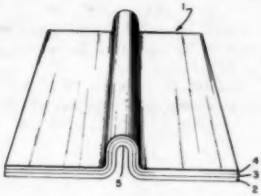
forming a pigmented layer by applying a pigmented metal interlock acrylic finish over said base layer, said pigmented finish containing an effective amount up to 50% of a paint comprised of a calcined earth pigment in an acrylic polymer emulsion.

4,680,238

THERMOSTATIC METAL

Jacob L. Ornstein, and Michael A. Hydock, Greensboro, both of N.C., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,361
Int. Cl.[4] B32B *15/18, 33/00*
U.S. Cl. 428—617 6 Claims



1. A thermostatic metal comprising a layer of a low expansion metal bonded to a layer of a high expansion metal, the outer surface of one of said layers comprising a layer of similar composition but containing, in addition, a sufficient amount of a grain growth limiting additive to prevent orange peel when said thermostatic metal is bent into a desired shape.

4,680,239

EXHAUST DEVICE HAVING A HEAT-INSULATING LAYER COMPRISING INORGANIC MICROBALLOONS AND A REFRACTORY LAYER AND METHOD OF MANUFACTURING SAME

Mitsuru Yano, Okagaki; Tomoyuki Kido, Kitakyushu, and Yoshiyuki Ochi, Mizumaki, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,687
Claims priority, application Japan, Jan. 11, 1985, 60-2722; Apr. 22, 1985, 60-85901
Int. Cl.[4] B32B *9/00, 7/02;* B05D *7/22*
U.S. Cl. 428—688 7 Claims

1. An exhaust device comprising:

a metal portion for passing high temperature exhaust gases therethrough, said metal portion having interior surfaces;

a heat-insulating layer adhered directly to said interior surfaces, said heat-insulating layer consisting of heat-resistant microballoons having a particle size in the range of from about 10 to 500 μm and an inorganic binder, said heat-insulating layer having a thickness of greater than about 1.5 mm; and

a refractory layer consisting essentially of a refractory material having a particle size of about 10 to 500 μm and an inorganic binder, said refractory layer overlaying said heat insulating layer and having a thickness greater than about 0.5 mm.

2. A method of manufacturing an exhaust device having on its inner surface a heat-insulating layer and a refractory layer, comprising:

a first step of forming said heat-insulating layer by conducting at least one cycle of the following steps:

(a) coating said inner surface with an inorganic binder solution;

(b) immediately adhering heat-insulating microballoons to the inorganic binder solution layer, said microballoons being fully and uniformly impregnated with said inorganic binder solution; and

(c) drying and solidifying the resulting heat-insulating microballoon layer by heat treatment; and

a second step of forming a refractory layer by conducting at least one cycle of the following steps:

(d) coating the surface of said heat-insulating layer with an inorganic binder solution;

(e) immediately adhering a refractory material to the inorganic binder solution layer, said refractory material being fully and uniformly impregnated with said inorganic binder solution; and

(f) drying and solidifying the resulting refractory material layer by heat treatment.

4,680,240

METHOD FOR STARTING FUEL CELL POWER SYSTEMS

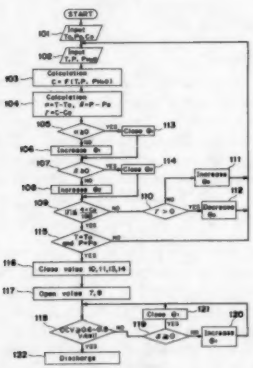
Nobuhiro Furukawa, Hirakata; Shuzo Murakami, and Masato Nishioka, both of Ibaraki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 17, 1986, Ser. No. 886,497

Claims priority, application Japan, Jul. 19, 1985, 60-160701

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—13 **1 Claim**



1. A method for starting fuel cell power systems comprising heating a fuel cell stack to a predetermined operating temperature with a circulating heat-exchanger fluid, while feeding a pressurized inert gas into a pressure vessel and process gas chambers of the fuel cell stack to increase pressures in the process gas chambers and pressure vessel to a predetermined pressure, detecting a temperature of the stack and a pressure of the inert gas in the process gas chambers, and controlling a vapor pressure in the inert gas fed to said chambers in proportion to said detected temperature and pressure in the process gas chambers so that a volume of a hygroscopic electrolyte is approximately kept constant.

4,680,241

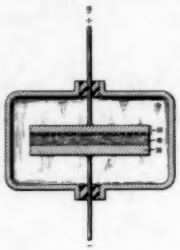
METHOD FOR RESTORING THE LOST CAPACITY OF NICKEL BATTERIES AND BATTERIES FORMED THEREBY

Christopher K. Dyer, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 556,138, Nov. 29, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,050

Int. Cl.[4] H01M *10/44;* **H02J** *7/06*

U.S. Cl. 429—49 **10 Claims**



1. A method for making a battery which includes a nickel positive electrode, a negative electrode, and an electrolyte, said nickel positive electrode having an initial capacity less than a theoretical capacity, C, of said battery, comprising the step of

cycling said battery at least 10 times, each cycle including both a discharging step during which the amount of charge withdrawn from the battery, q_D, is greater than or equal to about 5 percent of the capacity achieved during the previous cycle, and a charging step

in which the charging rate is greater than C/10 per hour, the amount of charge delivered to said battery during said charging step, q_C, is greater than q_D and is chosen so that a temperature of said electrolyte does not exceed about 30 degrees Centigrade.

4,680,242

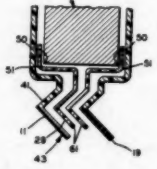
WRAPPED BATTERY PLATE

Robert D. Simonton, Fremont, and Douglas E. Breese, Oregon, both of Ohio, assignors to Fremont Special Machine Company, Inc., Fremont, Ohio

Continuation of Ser. No. 747,716, Jun. 24, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 871,306

Int. Cl.[4] H01M *2/18*

U.S. Cl. 429—136 **11 Claims**



1. A wrapped battery plate comprising a rectangular plate having opposed major faces having longitudinal sides and

transverse sides, and having edges at the intersections of said sides with said major faces; a single rectangular wrapper sheet of flexible material which is permeable to electrolyte and compatible with the products of electrolytic action within the cell in which the wrapped plate is adapted to be utilized said sheet being wrapped around said longitudinal sides and longitudinal edges of said plate and having opposed longitudinal margins in close proximity over their lengths laying against one of said major faces of said plate, a joint between said opposed longitudinal margins of said wrapper sheet over their length on said one face of said plate with the joined wrapper sheet margins generally parallel to said one face; a first transverse margin region of said wrapper sheet extending between said longitudinal sides at one end of said wrapper sheet and projecting beyond the transverse side and edges of said plate proximate said one end of said wrapper sheet; a broad area bond along said first transverse margin region of said wrapper sheet between portions of the sheet transverse margin overlaying each other and projecting beyond the proximate transverse side of said plate closely adjacent said transverse side and said bond area being of a width of at least the thickness of the plate and of a length corresponding to the length of the plate transverse side; and an accordion pleat extending along said broad area bond parallel to the adjacent transverse side of the plate and having portions of said bond on each side of the pleat fold.

4,680,243

METHOD FOR PRODUCING A MASK FOR USE IN X-RAY PHOTOLITHOGRAPHY AND RESULTING STRUCTURE

Alexander R. Shimkunas, Palo Alto, and Barry Block, Los Altos Hills, both of Calif., assignors to Micronix Corporation, Los Gatos, Calif.

Filed Aug. 2, 1985, Ser. No. 761,993

Int. Cl.[4] G21K *5/00*; G03F *9/00*; B44C *1/22*; C23F *1/02*

U.S. Cl. 430—5 **61 Claims**

28. A mask for use in photolithography comprising:

a silicon ring;

an x-ray transparent layer of material supported by said silicon ring;

a glass ring bonded to said silicon ring, said bond being produced by a field assisted thermal bonding process.

4,680,244

LIGHT-SENSITIVE RECORDING MATERIAL FOR THE PRODUCTION OF A PRINTING FORM OR PRINTED CIRCUIT WITH PHOTOCONDUCTIVE LAYER AND LIGHT-SENSITIVE OVERLAYER

Peter Lehmann, Kelkheim, Fed. Rep. of Germany, and Manfred Michel, Suzano, Brazil, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,660

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409888

Int. Cl.[4] G03C *5/14*, *1/495*, *1/54*

U.S. Cl. 430—66 **8 Claims**

1. A light-sensitive recording material comprised of

(A) an electrically conductive support which is suitable for the production of printing forms or printed circuits,

(B) at least one photoconductive layer having a first and a second surface, said photoconductive layer (i) containing a resin binder which is soluble in an aqueous alkaline or alcoholic alkaline solvent and (ii) being applied along said first surface to said support, and

(C) a light-sensitive covering layer applied to said second surface of said photoconductive layer, said covering layer comprising a photochemically reactive composition which contains at least one compound having a solubility in an aqueous alkaline or alcoholic alkaline solvent which is increased by actinic radiation, whereby said solvent is capable of decoating actinic radiationexposed portions of said covering layer and portions of said photoconductive layer located beneath the portions of said covering layer.

4,680,245

ELECTROPHOTOGRAPHIC POSITIVELY CHARGEABLE DEVELOPER CONTAINING SILICA TREATED WITH A NITROGEN CONTAINING SILANE COUPLING AGENT AND METHOD OF DEVELOPING

Koshi Suematsu, Kawasaki, and Eiichi Imai, Narashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,090, Apr. 2, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 929,495

Claims priority, application Japan, Apr. 12, 1983, 58-63935; May 31, 1983, 58-96511; May 31, 1983, 58-96512; Jun. 22, 1983, 58-112411; Jun. 23, 1983, 58-113965

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—110 **11 Claims**

1. A dry developing method, which comprises:

(a) disposing an electrostatic image bearing member having an electrostatic image on its surface and a developer carrying member having a surface for carrying an insulating dry developer thereon with a gap between said electrostatic image bearing member and said developer carrying member; and

(b) coating said insulating dry developer on said developer carrying member, wherein said insulating dry developer is positively chargeable and comprises toner particles containing a binder resin and a colorant or a magnetic powder, and fine silica particles treated with a nitrogen-containing silane coupling agent represented by the formula:

$$R_mSiY_n$$

wherein R is an alkoxy group or chlorine, m is an integer of from 1 to 3, Y is an unsaturated nitrogen-containing heterocyclic group or derivative thereof, and n is an integer of from 1 to 3, wherein m+n is 4; and

(c) bringing the coated insulating developer to said gap, wherein the insulating developer on said developer carrying member surface at said gap has a thickness thinner than said gap and causing the insulating developer to jump to the electrostatic image to effect development.

4,680,246

METHOD FOR PRODUCING AN ELECTROPHOTOGRAPHIC ELEMENT

Motohisa Aoki, and Hironobu Iwanaga, both of Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 709,902, Mar. 8, 1985, abandoned, which is a division of Ser. No. 508,038, Jun. 27, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 873,451

Claims priority, application Japan, Jun. 29, 1982, 57-112423

Int. Cl.[4] G03G *5/00*

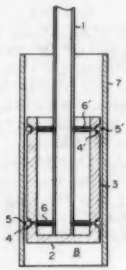
U.S. Cl. 430—133 **1 Claim**

1. A process for producing an electrophotographic element, which comprises:

inserting a hollow, cylindrical, solid bottomed closed ended member, having at least one circumferential groove formed in the outside wall thereof and at least one fluid-tight inflatable member mounted within said at least one groove or mounted covering the opening of the groove and communicating a hollow rod with said inflatable member, within a lower portion of a hollow, bottomless cylindrical body having a uniform inner diameter surface portion;

feeding a fluid through said hollow rod to inflate said inflatable member so as to contact said uniform inner diameter surface portion of said bottomless cylindrical body;

immersing said bottomless cylindrical body in a liquid containing a photosensitive material so as to coat an outside surface of said cylindrical body, to confine an ambient gas beneath said solid bottomed closed ended member and to



prevent said liquid containing a photosensitive material from entering into the inner space of said cylindrical body except a lowermost portion thereof; and

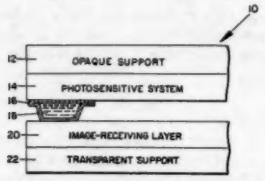
separating said bottomless, cylindrical body from said liquid containing said photosensitive material so as to form a uniform photosensitive layer on said outside surface thereof.

4,680,247

PHOTOGRAPHIC PROCESSING COMPOSITION WITH POLY(DIACETONE ACRYLAMIDE) OXIME AND STYRENE-BUTADIENE LATEX

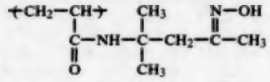
Richard J. Murphy, Dennis Port, Mass., assignor to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Filed Mar. 31, 1986, Ser. No. 846,587
Int. Cl.[4] G03C *5/54, 5/26*
U.S. Cl. 430—215 **9 Claims**



4. A photographic product for forming a diffusion transfer image within a permanent laminate comprising, in combination, a first support carrying at least one photosensitive silver emulsion layer, each said silver halide emulsion having associated therewith an image-forming material; a second support carrying an image-receining layer; and a photographic processing composition adapted to be distributed between the silver halide layer or layers and the image-receiving layer and effective to develop the silver halide emulsion or emulsions after photoexposure and form a transfer image in said image-receiving layer and effective to mask the developed silver halide layer or layers and provide a light-reflecting background for the viewing of said transfer image, said photographic processing composition comprising an aqueous alkaline medium having therein:

a polymeric oxime viscosity-increasing agent comprising recurring units of the formula



said polymeric oxime viscosity-increasing agent being present in an amount in the range of about 0.5% to about 1% by weight of the composition;

a light-reflecting pigment; and

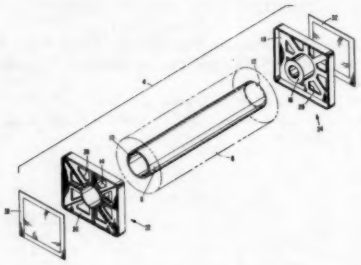
a carboxylated styrene-butadiene latex, said carboxylated styrene-butadiene latex being present in an amount in the range of about 1.5% to about 3% by weight of the composition.

4,680,248

USE OF DESICCANT TO CONTROL EDGE FUSION IN DRY FILM PHOTORESIST

Donald J. Roach, Gloucester, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 19, 1985, Ser. No. 767,210
Int. Cl.[4] G03C *3/00;* **G03B** *17/26*
U.S. Cl. 430—270 **3 Claims**



1. An element comprising a laminate of an aqueous developable photoresist composition sandwiched between a film support and a protective cover sheet enclosed in a moisture proof container with an amount of dessicant sufficient to maintain the relative humidity below about 20% inside said container.

4,680,249

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING CARBOXY BENZOTRIAZOLE

Gregory C. Weed, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 28, 1986, Ser. No. 867,431
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—281 **2 Claims**

1. In a photosensitive composition comprising

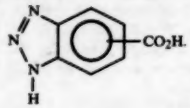
(a) addition polymerizable ethylenically unsaturated monomer,

(b) an initiating system activatable by actinic radiation

(c) an amphoteric polymer derived from interpolymerization of (1) at least one basic comonomer which is an acrylic or methacrylic acrylamide or methacrylamide, an aminoalkyl acrylate or methacrylate or mixture of any of these; (2) at least one acidic comonomer containing one or more carboxyl groups and (3) at least one further comonomer which is acrylic or methacrylic in character;

wherein the improvement comprises incorporation in the composition of

(d) a carboxy benzotriazole of the formula:

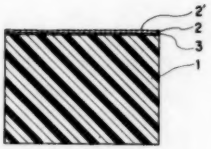


4,680,250

COMPOSITE ALUMINUM SHEET FOR PRESENSITIZED LITHOGRAPHIC PRINTING PLATE COMPRISING A SUPPORT HAVING SPECIFIED CENTER LINE AVERAGE ROUGHNESS

Hironori Kitamura, Nagaokakyo, and Kanji Noma, Osaka, both of Japan, assignors to Nippon Foil Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 541,778, Oct. 13, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 801,502
Claims priority, application Japan, Dec. 6, 1982, 57-214527
Int. Cl.[4] G03F 7/02; G03C 1/76
U.S. Cl. 430—302 8 Claims



1. A composite sheet for a presensitized lithographic printing plate, comprising a support of a synthetic resin film and an aluminum foil thereon, said aluminum foil having a matt surface with a roughness of 0.20 to 0.65 μmR_a on one surface thereof and a thickness of from 7 to 80 μm, said foil prepared by twice or more pack rolling doubled aluminum foils under the conditions of a roll load of 100 to 250 kg/mm, a rolling speed of 100 to 800 m/min and a reduction per pass of 20 to 65%, said aluminum foil positioned on said support so that the matt surface thereof faces outside.

4,680,251

PROCESS FOR THE OZONE PROTECTION OF PHOTOPOLYMER FLEXOGRAPHIC PRINTING PLATES BY TREATMENT WITH LIQUID POLYETHERS

Manfred Schober, Offenbach, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1985, Ser. No. 724,771
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415045
Int. Cl.[4] G03F 7/10, 7/02
U.S. Cl. 430—306 9 Claims

1. A process for the ozone protection of an imagewise exposed and developed photopolymer flexographic printing plate, having an elastomeric, thermoplastic polymeric binder, which comprises applying to the exposed and developed surface of the flexographic printing plate at least one known liquid polyether of the formulas:

$$H-[O-CH(R_1)-CH_2]_n-O-R_2; \quad (a)$$

$$H-[O-CH_2-CH_2-CH_2]_n-O-R_2; \quad (b)$$

a block copolymer of the formula (c)

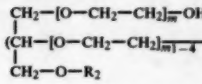
$$HO-(CH_2-CH_2-O)_y-(CH(CH_3)-CH_2-O)_x-(CH_2-CH_2-O)_zH;$$

-continued

a random copolymer of the formula (d)

$$HO-(CH_2-CH_2-O)_y-(CH(CH_3)-CH_2-O-)_xH;$$

(e)



wherein

R_1=H, or methyl

R_2=H, alkyl or alkylene with C_{12}–C_{18}, and saturated and unsaturated fatty acid radicals with C_{12}–C_{18}.

p=1–4

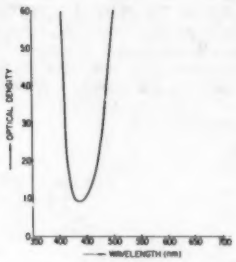
and wherein n, m and m_{1-4} and x, y, and z are so selected that the molecular weight ($\overline{M}_n$) of the molecule is about 500 to 5000.

4,680,252

SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL FOR RADIOGRAPHIC USE

Akio Suzuki; Takeo Koitabashi; Masatoshi Iwata; Hisashi Yamaguchi, and Syoji Matsuzaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 659,857, Oct. 11, 1984, abandoned, which is a continuation of Ser. No. 406,854, Aug. 9, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 757,518
Claims priority, application Japan, Aug. 21, 1981, 56-130215
Int. Cl.[4] G03C 1/02, 1/06, 1/76
U.S. Cl. 430—364 6 Claims



1. A silver halide light-sensitive photographic material for radiographic use comprising a transparent support provided with a silver halide emulsion layer on both sides thereof, said support having a blue light transmission density D_S and said material having a blue light transmission density D_M, both before development, whereby $0.35 \leqq D_M - D_S \leqq 0.60$.

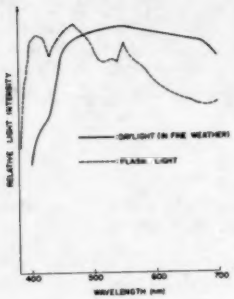
4,680,253

COLOR PHOTOGRAPHIC MATERIAL

Yoshihiko Shibahara, and Hideto Ikoma, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1986, Ser. No. 832,707
Claims priority, application Japan, Feb. 26, 1985, 60-37117
Int. Cl.[4] G03C 1/10, 7/26, 1/46
U.S. Cl. 430—504 7 Claims

1. A silver halide color photographic material which comprises a support having coated thereon at least one blue-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer and at least one red-sensitive silver halide emulsion layer, characterized in that the gradation of each of the blue-, green- and red-sensitive layers satisfies the following relation:



$$\frac{\gamma_B(10^{-4})}{\gamma_B(10^{-2})} < \frac{\gamma_G(10^{-4})}{\gamma_G(10^{-2})} \leqq \frac{\gamma_R(10^{-4})}{\gamma_R(10^{-2})} < 0.99$$

wherein $\gamma_B(10^{-4})$, $\gamma_G(10^{-4})$ and $\gamma_R(10^{-4})$ represent gradation of the blue-, green- and red-sensitive layers upon 1/10,000 second exposure, respectively and $\gamma_B(10^{-2})$, $\gamma_G(10^{-2})$ and $\gamma_R(10^{-2})$ represent those upon 1/100 second exposure, respectively.

4,680,254

EMULSIONS AND PHOTOGRAPHIC ELEMENTS CONTAINING SILVER HALIDE GRAINS HAVING HEXOCTAMEDRAL CRYSTAL FACES

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 771,861, Sep. 3, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,768

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—567 **11 Claims**

1. A silver halide photographic emulsion comprised of radiation sensitive silver halide grains of a cubic crystal lattice structure comprised of hexoctahedral crystal faces.

4,680,255

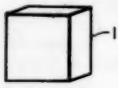
EMULSIONS AND PHOTOGRAPHIC ELEMENTS CONTAINING SILVER HALIDE GRAINS HAVING TETRAHEXAHEDRAL CRYSTAL FACES

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 772,228, Sep. 3, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,769

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—567 **11 Claims**



1. A silver halide photographic emulsion comprised of radiation sensitive silver halide grains of a cubic crystal lattice structure comprised of tetrahexahedral crystal faces.

4,680,256

EMULSIONS AND PHOTOGRAPHIC ELEMENTS CONTAINING SILVER HALIDE GRAINS HAVING TRISOCTAHEDRA CRYSTAL FACES

Joe E. Maskasky, Rochester, and Ralph W. Jones, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 772,229, Sep. 3, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 882,112

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—567 **11 Claims**

1. A silver halide photographic emulsion comprised of radiation sensitive silver halide grains of a cubic crystal lattice structure comprised of trisoctahedral crystal faces.

4,680,257

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideaki Sato, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 586,922, Mar. 7, 1984, abandoned. This application Sep. 13, 1985, Ser. No. 775,959

Claims priority, application Japan, Mar. 7, 1983, 58-36907

Int. Cl.[4] G03C *1/30, 1/06*

U.S. Cl. 430—614 **14 Claims**

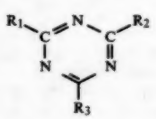
1. A silver halide photographic light-sensitive material comprising a support base having thereon:

a silver halide emulsion layer containing a hardener having an active vinyl group represented by the structural formula (II):

$$(CH_2{=}CH{-}SO_2{-}CH_2)_2{-}A \qquad \text{(II)}$$

wherein A represents a divalent group which is optionally present; and

a compound represented by the general formula (I):



wherein R_1, R_2 and R_3 independently represent a hydroxy group, a hydroxylamino group, an amino group, an alkylamino group, a substituted alkylamino group, an arylamino group, an alkoxy group, a phenoxy group, an alkyl group, an aryl group or a halogen atom such that when one of R_1, R_2 and R_3 represents a halogen atom the other two of R_1, R_2 and R_3 do not represent a halogen atom, said compound represented by the general formula (I) being contained in said silver halide emulsion layer in an amount sufficient to reduce latent image fading.

4,680,258

PROCESS FOR SEX DETERMINATION IN MAN BY USE OF MONOCLONAL ANTIBODIES TO THE H-Y ANTIGEN

Ulrich Hammerling, New York, N.Y.; Gloria C. Koo, Woodbridge, N.J., and Nobuhiko Tada, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 247,191, Mar. 24, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,635

Int. Cl.[4] G01N *33/577*; C12N *5/00*; C12P *15/00*; A61K *39/395*

U.S. Cl. 435—7 17 Claims

1. Hybridoma cell lines selected from the group consisting of ATCC HB 9070, ATCC HB 9071 and ATCC HB 9072 producing monoclonal antibodies 12/44, 12/49, and 11/6 which specifically bind to the H-Y antigen.

4,680,259

ANALYTICAL ELEMENT AND METHOD FOR COLORIMETRIC DETERMINATION OF TOTAL CHOLESTEROL

Peter E. Cumbo, and Robert F. Fricker, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,590

Int. Cl.[4] C12Q *1/60, 1/28, 1/44*

U.S. Cl. 435—11 20 Claims

1. An analytical element for the colorimetric determination of total cholesterol in an aqueous liquid, said element comprising an absorbent material, and containing

a peroxidative substance in an amount equivalent to a peroxidase activity of at least 40,000 I.U./m^2,

a colorimetric composition which, in the presence of hydrogen peroxide and said peroxidative substance, produces a color change,

cholesterol oxidase,

a nonionic surfactant present in an amount of from about 5 and up to, but less than 11 g/m^2, and

cholesterol ester hydrolase present in an amount of from about 1500 to about 12,000 I.U./m^2.

4,680,260

METHOD FOR PRODUCING HUMAN LEUKOCYTE INTERFERON ALPHA-2

Vladimir G. Debabov; Jury D. Tsygankov, both of Moscow; Andrei J. Chistoserdov, Moskoskaya oblast; Evgeny D. Sverdlov, Moscow; Lara S. Izotova, Moscow; Sergei V. Kostrov, Moscow; Viktor E. Sterkin, Moscow; Vladimir P. Kuznetsov, Moscow; Sergei V. Belyaev, Moscow; Galina S. Monastyrskaya, Moscow; Irina S. Salomatina, Moscow; Grigory M. Dolganov, Moscow; Sergei G. Arsenian, Moscow; Sergei A. Tsarev, Moscow; Jury I. Kozlov, Moscow; Alexandr Y. Strongin, Moscow; Vsevolod I. Ogarkov, Moscow, and Jury A. Ovchinnikov, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Genetiki, Mowcow, U.S.S.R.

Filed Jul. 3, 1985, Ser. No. 751,798

Claims priority, application U.S.S.R., Jul. 13, 1984, 3757952

Int. Cl.[4] C12P *21/00*; A61K *45/02*

U.S. Cl. 435—68 2 Claims

1. A method for producing human leukocyte interferon alpha-2, which comprises carrying out submerged cultivation of a producer strain Pseudomonas species VG-84 carrying a plasmid pVG3 with an inserted gene of human leukocyte interferon alpha-2, said strain being deposited in the collection of microorganism cultures at the USSR Antibiotics Research Institute under Reg. No. 1742; and strain being cultivated in a nutrient medium, containing the sources of carbon an nitrogen, mineral salts and growth stimulants, under aeration in the presence of streptomycin or tetracycline, or a mixture of both, followed by isolation and purification of the end product.

4,680,261

PROCESS FOR PRODUCING INTERFERON

Masahiro Nobuhara, Iwatsuki; Toshinori Kanamori, Kasukabe; Kiyoshi Yamaguchi, Kawaguchi, and Ei Mochida, Toshima, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,761

Claims priority, application Japan, Sep. 17, 1983, 58-171733

Int. Cl.[4] C12P *21/00*; A61K *45/02*

U.S. Cl. 435—68 11 Claims

1. A process for producing interferon comprising, culturing an interferon-producing mammalian cell in a cell culture medium containing an inorganic vanadium compound, in an amount sufficient to enhance interferon production.

4,680,262

PERIPLASMIC PROTEIN RECOVERY

Barry R. Bochner, Alameda; Kenneth C. Olson, Burlingame, and Rong-Chang Pai, Foster City, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Oct. 5, 1984, Ser. No. 658,339

Int. Cl.[4] C12P *21/00*; C12N *15/00, 1/06*

U.S. Cl. 435—68 24 Claims

1. A method for recovering protein from the periplasmic space of a bacterial cell transformed to secrete a eukaryotic protein, comprising

(a) contacting the cell with an effective amount of a lower alkanol having between two to four carbon atoms for a time and at a temperature sufficient to kill the cell without lysing the inner membrane;

(b) freezing the cell;

(c) thawing the cell; and

(d) receiving the periplasmic proteins, including the eukaryotic protein, from the remainder of the cell.

4,680,263

CONTINUOUS ALCOHOL MANUFACTURING PROCESS USING IMMOBILIZED MICROORGANISM

Tomiaki Yamada, Yokohama; Masuo Kamihonoki, Ishioka; Hiroshi Sagara, and Hiroshi Umino, both of Yokohama, all of Japan, assignors to New Energy Development Organization; JGC Corporation and Sanraku-Ocean Co., Ltd., all of Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,530

Claims priority, application Japan, Sep. 27, 1982, 57-169349

Int. Cl.[4] C12P *7/14, 7/06*; C12M *1/40*

U.S. Cl. 435—162 26 Claims

1. A continuous alcohol manufacturing process wherein, in a fermentation system, a fermenter is packed with an alcohol-producing microorganism immobilized on a carrier; comprising the steps of continuously supplying a sugar-containing liquid to said fermenter so as to effect alcohol fermentation; continuously removing from the fermenter a portion of said fermentation liquid which has contacted said immobilized microorganism; heating said removed liquid to a temperature of from 50° to 80° C. in a heater; introducing said heated liquid into a flash tank held under reduced pressure of from 60 to 300 mm Hg absolute thereby to divide said heated liquid into an alcohol-containing vapor and a separated liquid; condensing said alcohol-containing vapor and removing it from the fermentation system; cooling said separated liquid to a temperature equal to or below the temperature within the fermenter; continuously recycling at least part of said separated liquid back to the fermenter, the flow rate at which said separated liquid is recycled into said fermenter being from 1 to 10 times the flow rate at which said sugar-containing liquid that is fed into said fermenter; and discharging a residue from the fermentation system.

8. A process according to claim 1 wherein in the fermentation system, a number n of fermenters are arranged in series, the sugar-containing liquid is continuously supplied to the first fermenter from the outside of the system, the fermentation

liquid taken out of said first fermenter is then heated and introduced into a first flash tank for dividing it into a first alcohol-containing vapor and a first separated liquid; the first separated liquid is cooled and part of it is recycled to the first fermenter and the balance is introduced into the second fermenter; the fermentation liquid taken out of the second fermenter is then heated and introduced into a second flash tank for separating it into a second alcohol-containing vapor and a second separated liquid; the second separated liquid is cooled and part of it is recycled to the second fermenter; the same procedure being repeated in the same manner for each fermenter, except for the final fermenter in the series, so that a liquid separated in a given flash tank is cooled and part of it is recycled to the fermenter associated with said given flash tank and the balance is introduced into the next following fermenter to provide the fermentation liquid for the next following fermenter, and wherein in each heating step the portion of the fermentation liquid that is removed from the preceding fermenter is heated to 50° to 80° C., and each flash tank is held under a reduced pressure of 60 to 300 mg Hg absolute.

4,680,264

CLASS II MOBILIZABLE GRAM-NEGATIVE PLASMID

Alfred Puhler; Reinhard Simon, and Ursula Priefer, all of Bielefeld, Fed. Rep. of Germany, assignors to Lubrizol Genetics, Inc., Boulder, Colo.

Filed Jul. 1, 1983, Ser. No. 510,334

Int. Cl.[4] C12N *15/00, 1/20, 1/00;* **C07N** *17/00*

U.S. Cl. 435—172.3 **27 Claims**

1. A composite DNA plasmid capable of replication in *E. coli* that is mobilizable, not self-transmissible, and having a broad host range that is co-extensive with plasmid RSF1010, comprising:

(a) a first DNA segment obtained from a plasmid containing a replicon functional in *E. coli;* and

(b) a second DNA segment having a maximum length of 6 kb, said second DNA segment characterized by a RSF1010 mob-locus operably linked to a RSF1010 replicon.

4,680,265

METHOD OF SELECTING RECOMBINANT DNA-CONTAINING STREPTOMYCES

Virginia A. Birmingham, Indianapolis, and Eugene T. Seno, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 25, 1984, Ser. No. 653,975

Int. Cl.[4] C12N *15/00, 1/20, 1/00;* **C12P** *21/00, 21/02, 21/04, 19/34;* **C12R** *1/365, 1/465, 1/485;* **C07H** *21/04*

U.S. Cl. 435—172.3 **46 Claims**

1. A method for selecting a recombinant DNA-containing Streptomyces host cell, said method comprising:

(a) transforming a tylosin-sensitive, restrictionless Streptomyces host cell with a recombinant DNA cloning vector capable of autonomous replication or integration in said Streptomyces host cell, said vector comprising a DNA sequence that confers resistance to tylosin, and

(b) culturing said transformed cell under growth conditions suitable for selection for tylosin resistance,

subject to the limitation that said host cell is susceptible to transformation, cell division and culture.

4,680,266

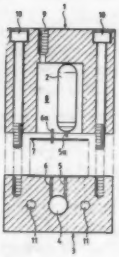
CELL CULTURE CHAMBER WITH MEANS FOR AUTOMATIC REPLENISHMENT OF NUTRIENT

Alexander Tschopp, Zürich, Switzerland; Claudy-Gabrielle Gruenblat-Nordau, Paris, France; Beat Huber, Hombrechtikon, and Augusto Cogoli, Zürich, both of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Nov. 21, 1985, Ser. No. 800,583

Int. Cl.[4] C12M *3/00*

U.S. Cl. 435—284 **2 Claims**



1. An apparatus for performing cell-biological experiments, especially under zero gravity conditions, comprising:

a housing;

said housing defining a pump cavity, a cell culture chamber, an inlet passage leading from said pump cavity to said cell culture chamber and an outlet passage leading from said cell culture chamber to said pump cavity;

an osmotic fluid pump located in said pump cavity and connected to said inlet passage for continuously dispensing a desired cell culture medium from said osmotic fluid pump into said cell culture chamber; and

said outlet passage serving for removal of expended cell culture medium from said cell culture chamber and return of said expended cell culture medium into said pump cavity.

4,680,267

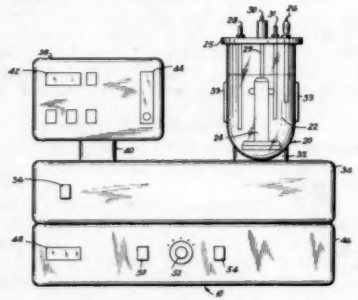
FERMENTOR CONTROL SYSTEM

Lee B. Eppstein, New Brunswick; Robert D. Mohler, Bridgewater, and Shaul Reuveny, Highland Park, all of N.J., assignors to New Brunswick Scientific Company, Inc., Edison, N.J.

Filed Mar. 1, 1985, Ser. No. 707,363

Int. Cl.[4] C12M *1/36*

U.S. Cl. 435—289 **20 Claims**



1. An apparatus for controlling a dissolved oxygen and pH of a medium during a bioreaction process in a vessel, comprising: pH sensing means for generating a signal related to the pH of the medium; dissolved oxygen sensing means for generating

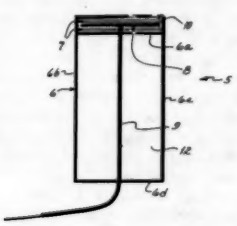
a signal related to the dissolved oxygen in the medium; valve means for selectively applying quantities of air, N_2, O_2 and CO_2 to the medium; and control means for producing a control signal for controlling the operation of the valve means so that a substantially fixed volume of gas consisting of one or more of air, CO_2, N_2 and O_2 is added to the medium, said control means determining in response to the dissolved oxygen and pH signals the amount of CO_2, O_2 and/or N_2 required to effect dissolved oxygen and pH correction and calculating from the required amounts the quantities of air, N_2, O_2 and/or CO_2 to compensate for the displacement of air as a result of the CO_2 added by adding N_2 when the N_2 required is greater than the CO_2 required, and adding O_2 when the amount of N_2 required is less than the amount of CO_2 required; whereby the effect of the CO_2 correction on the dissolved oxygen is substantially minimized.

4,680,268

IMPLANTABLE GAS-CONTAINING BIOSENSOR AND METHOD FOR MEASURING AN ANALYTE SUCH AS GLUCOSE

Leland Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Sep. 18, 1985, Ser. No. 777,234
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—291 **45 Claims**



1. A device for sensing a product or reactant of an enzyme reaction with an analyte as a measure of the analyte comprising

a gas permeable membrane having opposed sides,

an enzyme on one side of said membrane for enzymatic reaction with the analyte in presence of oxygen to provide the product or reactant,

a closed container for containing oxygen on the opposite side of said membrane to supply oxygen through said membrane for the enzymatic reaction, and

means for sensing the product or reactant as a function of the analyte.

41. A method of sensing a product or reactant of an enzyme reaction with an analyte as a measure of the analyte comprising

providing a gas permeable membrane having opposed sides,

providing an enzyme on one side of the membrane for enzymatic reaction with the analyte in presence of oxygen to generate the product or reactant,

providing a closed container containing oxygen on the opposite side of the membrane to supply oxygen through the membrane for the enzymatic reaction, and

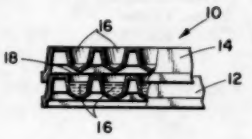
sensing the product or reactant which functions as a measure of the analyte.

4,680,269

METHOD AND APPARATUS FOR PREVENTING CROSS-CONTAMINATION OF BIOCHEMICAL TEST WELLS IN A MICROTITER TEST PLATE

Harry B. Naylor, Lakewood, Colo., assignor to Pasco Laboratories, Inc., Wheatridge, Colo.

Filed Apr. 15, 1985, Ser. No. 723,360
Int. Cl.[4] C12M *1/20*
U.S. Cl. 435—301 **5 Claims**



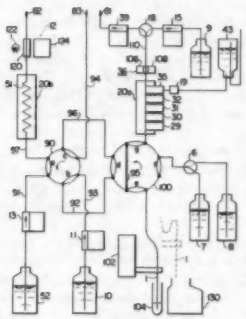
1. In combination in a test kit for use in evaluating the effectiveness of antibacterial agents to kill pathogenic bacteria, which comprises: a base having a plurality of upwardly-opening wells, a lid fitted to the base and having a cover-forming portion spaced above the wells therein cooperating therewith to confine and define a common atmosphere above the wells, and a porous sheet impregnated with an acidic compound effective to intercept and neutralize alkaline gases evolved in the wells therebeneath when positioned to cover said wells, said lid including means projecting from the underside of said cover-forming portion positioned and adapted to engage said sheet and hold same in substantially sealed relation atop the wells in the base.

4,680,270

METHOD AND APPARATUS FOR CONDUCTING FLOW ANALYSIS

Hiroshi Mitsumaki; Nobuyoshi Takano, and Naoya Ono, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,050
Claims priority, application Japan, Jul. 2, 1982, 57-113951
Int. Cl.[4] G01N *35/08, 27/40*
U.S. Cl. 436—52 **15 Claims**



1. A method of flow analysis using a switch-valve having a volumetric section and a first analytical detector with at least one ion selective electrode, comprising the steps of:

communicating said volumetric section and said first detector,

aspirating an undiluted liquid sample through conduits in both said volumetric section and said first detector,

switching said switch-valve to force out the undiluted sample within said volumetric section with a diluent,

diluting said sample with said diluent while transferring said

sample and introducing it into a second detector for analytic determinations; and

obtaining one type of determination for an undiluted sample from said first detector and also obtaining a different determination for a diluted sample from said second detector.

4,680,271

PROCESS AND APPARATUS FOR ANALYSIS

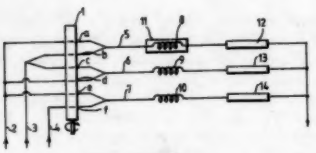
John Williams, Mt. Helens, England, assignor to Interox Chemicals Limited, London, England

Filed Jan. 22, 1985, Ser. No. 693,295

Claims priority, application United Kingdom, Jan. 21, 1984, 8401630

Int. Cl.[4] **G01N** *21/78, 21/85, 35/08;* **G05D** *21/00*

U.S. Cl. 436—55 **19 Claims**



1. A continuous process for the analysis of a sample of a body of liquid containing a peroxycompound and hydrogen peroxide by a colorimetric technique, comprising the following steps (a)–(e):

(a) continuously taking a sample from said body of liquid;

(b) continuously mixing said sample with a colorimetric reagent to provide a mixed sample, said reagent being selected to react with the peroxycompound and the hydrogen peroxide at an elevated temperature and only with hydrogen peroxide at a lower temperature:

(c) dividing said mixed sample into first and second streams, each of said first and second streams containing a mixture of said sample and said colorimetric reagent;

(d) continuously heaing said first stream to said elevated temperature so that the peroxycompound and the hydrogen peroxide react with the colorimetric reagent whilst maintaining said second stream at said lower temperature so that only the hydrogen peroxide reacts with the colorimetric reagent; and

(e) thereafter effecting continuous differential colorimetric analysis between said first stream after heating and said second stream to provide a differential signal, whereby said differential signal provides a measure of the concentration of the peroxycompound in said body of liquid.

5. Apparatus for the continuous analysis of a sample of a body of liquid containing a peroxycompound and hydrogen peroxide by a colorimetric technique comprising:

means for continuously taking a sample from a body of liquid;

mixing means for continuously mixing the sample with a colorimetric reagent to provide a mixed sample, the reagent being selected to react with the peroxycompound and the hydrogen peroxide at an elevated temperature and only with hydrogen peroxide at a lower temperature;

means for dividing the mixed sample into first and second streams, each of the first and second streams containing a mixture of the sample and the colorimetric reagent;

means for continuously heaing the first stream to said elevated temperature so that the peroxycompound and the hydrogen peroxide react with the colorimetric reagent;

means for maintaining the second stream at said lower temperature so that only the hydrogen peroxide reacts with the colorimetric reagent; and

means for effecting continuous differential colorimetric analysis between the first stream after heating and the second stream to provide a differential signal, whereby said differential signal provides a measure of the concentration of the peroxycompound.

9. A continuous process for the analysis of a sample of a body of liquid containing a peroxycompound and hydrogen peroxide by a colorimetric technique, comprising the following steps (a)–(e):

(a) continuously taking a sample from said body of liquid;

(b) dividing said sample into at least two streams;

(c) continuously mixing each of said at least two streams with a colorimetric reagent to provide at least first and second streams each containing a mixture of said sample and said colorimetric reagent, said colorimetric reagent being selected to react with the peroxycompound and the hydrogen peroxide at an elevated temperature and only with hydrogen peroxide at a lower temperature;

(d) continuously heating said first stream to said elevated temperature so that the peroxycompounp and the hydrogen peroxide react with the colorimetric reagent whilst maintaining said second stream at said lower temperature so that only the hydrogen peroxide reacts with the colorimetric reagent; and

(e) thereafter effecting continuous differential colorimetric analysis between said first stream after heating and said second stream to provide a differential signal, whereby said differential signal provides a measure of the concentration of the peroxycompound in said body of liquid.

14. Apparatus for the continuous analysis of a sample of a body of liquid containing a peroxycompound and hydrogen peroxide by a colorimetric technique comprising:

means for continuously taking a sample from a body of liquid;

means for dividing the sample into at least two streams;

mixing means for continuously mixing each of the at least two streams with a colorimetric reagent to provide first and second streams each containing a mixture of the sample and the colorimetric reagent, the reagent being selected to react with the peroxycompound and the hydrogen peroxide at an elevated temperature and only with hydrogen peroxide at a lower temperature;

means for continuously heating the first stream to said elevated temperature so that the peroxycompound and the hydrogen peroxide react with the colorimetric reagent;

means for maintaining the second stream at said lower temperature so that only the hydrogen peroxide reacts with the colorimetric reagent; and

means for effecting continuous differential colorimetric analysis between the first stream after heating and the second stream to provide a differential signal, whereby said differential signal provides a measure of the concentration of the peroxycompound.

4,680,272

METHOD FOR DETECTING MOLECULES CONTAINING AMINE OR THIOL GROUPS

Tammy L. Smith, Los Angeles, Calif., assignor to University of California, Berkeley, Calif.

Filed Oct. 23, 1985, Ser. No. 790,349

Int. Cl.[4] **G01N** *21/77, 33/52, 33/68*

U.S. Cl. 436—86 **15 Claims**

1. A method of analyzing a solution for the presence of molecules having amine or thiol groups, comprising the steps of:

(a) providing a sample of the solution;

(b) adding a halogenated maleimide to said sample to form a mixture;

(c) applying ultraviolet light to said mixture; and

(d) monitoring said mixture for fluorescence, wherein any fluorescence in said mixture indicates the presence of molecules containing amine or thiol groups in the solution.

4,680,273

ASSAY FOR VITAMIN B12 DEFICIENCY

Victor Herbert, 322 E. 61st St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 760,100, Jul. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 713,834, Mar. 20, 1985, abandoned. This application May 22, 1986, Ser. No. 865,846

Int. Cl.[4] G01N *33/82*

U.S. Cl. 436—92 16 Claims

1. A process for determining Vitamin B_{12} deficiency, comprising:

assaying in a blood sample at least one of (a) Vitamin B_{12} carried by TCII and (b) Vitamin B_{12} in the sample other than Vitamin B_{12} carried by TCII; and determining Vitamin B_{12} deficiency by at least one of (c) essential absence of Vitamin B_{12} carried by TCII in the blood smaple and (d) essentially all Vitamin B_{12} in the blood sample being Vitamin B_{12} other than Vitamin B_{12} carried by TCII.

4,680,274

PARTICLES FOR INHIBITING NON-SPECIFIC IMMUNOREACTION

Yasuo Sakai, and Miyoshi Hirata, both of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,278

Claims priority, application Japan, Jun. 1, 1984, 59-112419

Int. Cl.[4] G01N *33/563, 33/543*

U.S. Cl. 436—512 11 Claims

1. In an immunoassay for a target antigen in a sample also containing materials capable of inducing non-specific immunoreaction in the immunoassay, wherein a specific immunoreaction proceeds between the target antigen and the corresponding antibody, the improvement which comprises adding to said sample ultrafine particles having an average particle size of 0.2 microns or smaller, which particles contain a substance not participating in said immunoreaction but being capable of inducing reactions with said materials in the sample and absorbing said materials into said particles, to thereby inhibit non-specific immunoreactions between said materials and the corresponding antibody.

4,680,275

HOMOGENEOUS FLUORESCENCE IMMUNOASSAY USING A LIGHT ABSORBING MATERIAL

Daniel B. Wagner, and Robert A. Baffi, both of Raleigh, N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 11, 1985, Ser. No. 700,578

Int. Cl.[4] G01N *33/543*

U.S. Cl. 436—518 28 Claims

1. A method for determining an unknown quantity of an analyte present in a fluid comprising:

(a) preparing a mixture by contacting an anti-analyte attached to the surface of a light transmitting solid support with a fluid containing an unknown quantity of an analyte, a tracer consisting of a fluorescent dye conjugated to said analyte or to a ligand specific for said analyte, and a light absorbing material having an absorption band which overlaps the absorption band of said tracer;

(b) incubating said mixture;

(c) applying to said mixture a pulse of excitation light through said solid support, the intensity and duration of said pulse being sufficient to cause the absorption of a portion of said excitation light by said tracer;

(d) detecting fluorescence emission from bound tracer, said emission being of sufficiently long decay time to be detected subsequent to completion of said light pulse and subsequent to the decay of substantially all light emission due to components of said mixture other than said bound tracer; and

(e) determining the quantity of said analyte in said fluid by comparing the magnitude of said fluorescence emission with the magnitude of fluorescence emission established for a known quantity of the analyte.

4,680,276

METAL POLYPEPTIDES

Jean-Francois Bach; Mireille Dardenne, both of Paris; Jean-Marie Pleau, Palaiseau; Jean Hamburger; Evangheios Bricas, both of Paris; Jean Martinez, General Leclerc; Didier Blanot, Bures S. Yvette; Genevieve Auger, Limours; Pierre Lefrancier, Bures sur Yvette, and Bernard Amor, Paris, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Continuation-in-part of Ser. No. 265,996, May 21, 1981, and Ser. No. 541,475, Oct. 13, 1983, abandoned, which is a continuation of Ser. No. 320,880, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 909,163, May 24, 1978, Pat. No. 4,301,065. This application Sep. 10, 1984, Ser. No. 648,834

Claims priority, application United Kingdom, May 22, 1980, 8017029; Sep. 22, 1980, 8030507; Japan, Sep. 9, 1983, 58-166414

Int. Cl.[4] G01N *33/536*

U.S. Cl. 436—542 47 Claims

1. A process for the preparation of a new product from a starting material selected from the serum thymic factor and its analogs and derivatives, which comprises reacting said starting material with a reactant containing metal ions or a metal-containing protein substance, said metal being capable of forming a IV co-ordination complex having a tetrahedral phase.

4,680,277

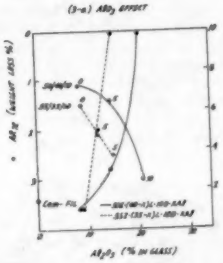
ALUMINA AND ALKALINE EARTH METAL OXIDE MODIFIED ZEOLITE GLASS COMPOSITION

Tetsuro Horiuchi, Gardena, Calif., assignor to Ensci Incorporated, Chatsworth, Calif.

Continuation of Ser. No. 537,254, Sep. 28, 1983, abandoned. This application Apr. 8, 1986, Ser. No. 849,585

Int. Cl.[4] C03C *6/02, 13/06, 3/062, 3/087*

U.S. Cl. 501—27 17 Claims



1. A glass-forming composition comprising:

naturally occurring pre-reacted zeolite and at least one added aluminum component separate from said zeolite in an amount sufficient to improve the fiberizability of the glass body formed from said composition, provided that said glass body contains about 30% to about 60% by weight of silica and about 2% to about 20% by weight of alumina.

4,680,278

PROCESS FOR PREPARING ALUMINUM NITRIDE POWDER

Hiroshi Inoue, Kawaguchi; Akihiko Tsuge, Yokohama, and Katsutoshi Komeya, Oiso, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1985, Ser. No. 812,012
Claims priority, application Japan, Dec. 24, 1984, 59-270950
Int. Cl.[4] C04B 35/58
U.S. Cl. 501—98 8 Claims

1. A process for preparing aluminum nitride powder, which comprises mixing (i) aluminum hydroxide powder, (ii) carbon powder or a substance capable of forming carbon powder by heating and (iii) at least one of additives selected from the group consisting of aluminum nitride powder, silicon nitride powder, silicon carbide powder and powder of substances capable of forming the powder corresponding to these powders, and baking the mixture thus obtained in a non-oxidative atmosphere containing nitrogen.

4,680,279

ABRASION RESISTANT REFRACTORY COMPOSITION

Thomas R. Kleeb, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 748,260, Jun. 24, 1985. This application Feb. 24, 1986, Ser. No. 832,915
Int. Cl.[4] C04B 35/18, 7/32
U.S. Cl. 501—124 6 Claims

1. A refractory composition consisting essentially of 0.5 to 5 weight percent volatilized silica; 3.0 to 15 weight percent −65 mesh alumina; 20 to 40 weight percent calcium aluminate cement; and the balance a refractory consisting essentially of a fire clay aggregate.

4,680,280

SULFUR TOLERANCE OF ZEOLITIC REFORMING CATALYSTS

Sue D. Pandey, Berkeley, and Waldeen C. Buss, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1985, Ser. No. 712,584
Int. Cl.[4] B01J 29/06, 29/12
U.S. Cl. 502—66 16 Claims

1. A reforming catalyst comprising a large-pore zeolite selected from the group consisting of the potassium, sodium, rubidium, or cesium forms of zeolite L and at least one reforming catalytic metal selected from the group consisting of Group VIII noble metals, having enhanced sulfur tolerance achieved by adding at least one desulfurization metal.

2. A catalyst according to claim 1 wherein at least one of said desulfurization metals is selected from the group consisting of the Group VIB metals.

11. A catalyst according to claim 1 wherein said zeolite is impregnated with said desulfurization metal prior to being impregnated with said catalytic metal.

12. A catalyst according to claim 1 wherein said catalyst also comprises an inorganic oxide binder.

4,680,281

PROCESS OF PRODUCING A V_2O_5-AND-ALKALI-METAL-SULFATE-CONTAINING CATALYST FOR OXIDIZING SO_2 TO SO_3

Wolfgang Fennemann, Karben, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,089
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401676
Int. Cl.[4] B01J 27/055, 21/08, 23/02, 23/16
U.S. Cl. 502—218 4 Claims

1. A process for producing a catalyst for convering SO_2 to SO_3 which comprises the steps of:

(a) impregnating silica prefabricated carrier bodies with an impregnating solution which contains 600 to 1100 grams H_2SO_4 and 140 to 830 grams V_2O_5 and alkali metal sulfate per liter at a temperature between 60° C. and the boiling temperature of the impregnating solution;

(b) drying the impregnated carrier bodies with agitation at a temperature of up to 700° C. to form a V_2O_5 and alkali metal sulfate catalyst; and

(c) activating said V_2O_5 and alkali metal sulfate catalyst by heating it under oxidizing conditions at a temperature of 750° to 900° C. for 5 to 120 minutes in counterflow to an oxidizing gas atmosphere.

4,680,282

POLLUTION CONTROL CATALYST FOR INTERNAL COMBUSTION ENGINE EXHAUST GASES AND PROCESS FOR PRODUCING IT

Gilbert Blanchard, Le Plessis-Belleville, and Michel Prigent, Rueil Malmaison, both of France, assignors to Pro-Catalyse, Rueil Malmaison, France

Filed Jul. 30, 1985, Ser. No. 760,575
Claims priority, application France, Jul. 30, 1984, 84 12047
Int. Cl.[4] B01J 21/06, 23/10, 23/44, 23/46
U.S. Cl. 502—304 23 Claims

1. A catalyst adapted for the treatment of internal combustion engine exhaust gases, which comprises (1) a support having (2) an active catalytic phase deposited thereon, said active catalytic phase comprising catalytically effective amounts of (i) zirconium, (ii) cerium, (iii) palladium, and (iv) at least one of the metals iridium and rhodium, said catalyst being produced by a process comprising (i) coating said support with a mixture of an alumina binder and an alumina filler, (ii) drying and calcinating said coated support, (iii) depositing cerium and zirconium on the support resulting from step (ii), (iv) drying and calcinating the support, (v) depositing palladium and iridium and/or rhodium on the carrier resulting from step (iv), and (vi) drying and calcinating the deposited carrier.

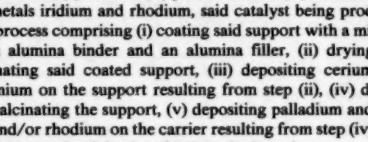
4,680,283

ANALOGS OF SUBSTANCE P AND ELEDOISIN

Daniel F. Veber, Ambler, and Roger Freidinger, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 852,479, Apr. 16, 1986, which is a continuation of Ser. No. 654,432, Sep. 26, 1984. This application Aug. 20, 1986, Ser. No. 898,274
Int. Cl.[4] A61K 37/02; C07K 7/02, 5/08, 5/10
U.S. Cl. 514—17 12 Claims

1. A compound of structural formula:



wherein

X is <Glu, <Glu-Gln, Ac-Ala, Ac-Phe, or Ac; and

Y is Phe, N-Me-Phe, Ile, Val or Tyr.

4,680,284
MODIFIED PHENYLALANINE PEPTIDYLAMINODIOLS

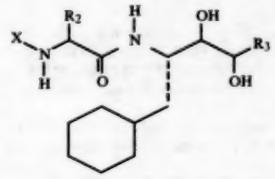
Jay R. Luly; Jacob J. Plattner, both of Libertyville, and Anthony K. Fung, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 693,951, Jan. 23, 1985, abandoned. This application Jan. 16, 1986, Ser. No. 818,714

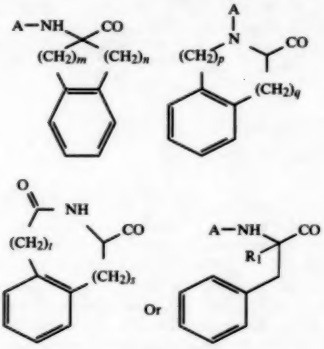
Int. Cl.[4] A61K *37/02*; C07K *5/08*; C07D *217/22, 217/00*; C07C *103/00, 103/20*

U.S. Cl. 514—18 9 Claims

1. A renin inhibiting compound of the formula:



wherein R_2 is loweralkyl or arylalkyl; R_3 is loweralkyl; X is



wherein A is hydrogen or an N-protecting group, R_1 is loweralkyl or arylalkyl, M is 1–3, m is 1–3, p is 1–3, q is 1–3, s is 1–3, and t is 0–2 and pharmaceutically acceptable salts thereof.

4,680,285
TREATMENT OF MALIGNANT TUMORS WITH 2-(β-D-RIBOFURANOSYLTHIAZOLE-4-CARBOXAMIDE RELATED COMPOUNDS

Roland K. Robins, Provo, Utah, assignor to Viratek, Inc., Costa Mesa, Calif.

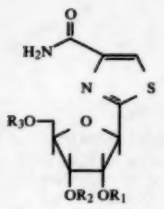
Continuation of Ser. No. 631,931, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 324,455, Nov. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 216,197, Dec. 15, 1980, abandoned. This application Feb. 27, 1985, Ser. No. 706,084

Int. Cl.[4] A61K *31/70*; C07H *5/00*

U.S. Cl. 514—23 16 Claims

1. A method of treating tumors in warm blooded animals comprising:

administering to said warm blooded animals an effective amount of a pharmaceutical composition containing as the active component at least about 0.1 percent by weight, based on the total weight of the composition, a compound of the structure:



wherein R_1 and R_2 are H or C_1–C_{18} acyl and R_3 is H, C_1–C_{18} acyl or

and physiologically acceptable salts thereof.

4,680,286
USE OF SELENIUM-CONTAINING COMPOUNDS FOR NEGATING THE TOXIC EFFECTS OF GOLD COMPOUNDS USED IN THE TREATMENT OF RHEUMATOID ARTHRITIS, AND A NOVEL SELENIUM-CONTAINING GOLD COMPOUND AND USE THEREOF AS AN ANTI-RHEUMATOID ARTHRITIS MEDICINE

Richard F. Stockel, 457 Rolling Hills Rd., Bridgewater, N.J. 08807, and Phillip E. Dumas, 137 Louise Dr., Morrisville, Pa. 19067

PCT No. PCT/US83/01239, § 371 Date Apr. 9, 1985, § 102(e) Date Apr. 9, 1985

Continuation-in-part of Ser. No. 347,708, Feb. 11, 1982, abandoned. This PCT application Aug. 10, 1983, Ser. No. 735,424

Int. Cl.[4] A61K *31/70*; C07H *23/00*

U.S. Cl. 514—23 5 Claims

1. A selenium-containing gold compound having the general formula:

$$(R_2)_3P\rightarrow Au—Se—R_1 \quad (I)$$

wherein

R_1 stands for

an unsubstituted or substituted glucose radical,

an unsubstituted or substituted malic acid radical,

an unsubstituted or substituted malate radical, or

an unsubstituted or substituted phenylcarbamoylmethyl radical; and

R_2 stands for a linear or branched alkyl group having 1 to 4 carbon atoms.

4,680,287
N-GLYCOSYLATED CARBOXAMIDE DERIVATIVES AS GROWTH-PROMOTERS IN LIVESTOCK FEEDING

Oswald Lockhoff, Cologne; Peter Stadler, Haan; Martin Scheer, Wuppertal; Friedrich Berschauer, Wuppertal, and Anno de Jong, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

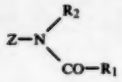
Filed Oct. 26, 1984, Ser. No. 665,241

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339694

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—42 6 Claims

1. A method of promoting the growth of animals which comprises administering to such animals a growth promoting effective amount of a compound of the formula



in which

Z is a glycosyl radical bonded via the anomeric carbon atom,

R_1 is hydrogen or an optionally substituted hydrocarbon radical having up to 30 carbon atoms optionally interrupted by O, N or S, and

R_2 is hydrogen or an alkyl or aralkyl radical having up to 30 carbon atoms optionally interrupted by O or substituted by groups containing oxygen or by halogen, with the proviso that COR_1 is not an acyl group having 1–5 carbon atoms when R_2 is an alkyl group having 10–20 carbon atoms.

4,680,288

SULFUR-CONTAINING 6-KETOPROSTAGLANDINS

Klaus Irmscher, Darmstadt-Eberstadt; Hans-Eckart Radunz, Mühltal; Ernst Schulze, and Bernhard Riefling, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

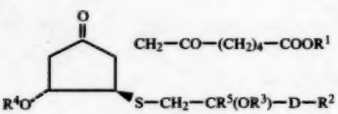
Filed Jan. 18, 1985, Ser. No. 692,490

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401542

Int. Cl.[4] C07C *177/00*; A61K *31/557*

U.S. Cl. 514—63 **19 Claims**

1. A sulphur-containing 6-ketoprostaglandin of the formula



in which

D is a bond, alkylene of 1–3 C atoms, cis-alkenylene of 2–5 C atoms or alkinylene of 2–5 C atoms,

R^1 is H, alkyl or 1–4 C atoms, aryl of 6–12 C atoms or $-C_6H_4NHCOC_6H_5$,

R^2 is alkyl of 1–7 C atoms, alkyl of 1–7 C atoms substituted by halogen, cycloalkyl of 5–6 C atoms, cycloalkyl of 5–6 C atoms substituted by alkyl of 1–4 C atoms, phenyl, phenyl substituted by F, Cl, Br, alkyl of 1–4 C atoms, OH, OCH_3 or CF_3, pyridyl, naphthyl, or thienyl, and when D is alkylene of 1–3 C atoms, R_2 also can be alkoxy of 1–4 C atoms, alkylthio of 1–4 C atoms, phenoxy or phenoxy substituted by F, Cl, Br, alkyl of 1–4 C atoms, OH, OCH_3 or CF_3,

R^3 and R^4 each are H, alkyl of 1–7 C atoms, tetrahydro-2-pyranyl, trialkylsilyl of a total of 3–12 C atoms, aryldialkylsilyl of a total of 8–18 C atoms, alkoxymethyl of 2–5 C atoms, aryloxymethyl of 7–11 C atoms, alkanoyl of 1–10 C atoms, aroyl of 7–10 C atoms, C_{1-7}-alkoxycarbonyl or C_{7-11}-aralkoxycarbonyl, and

R^5 is H or alkyl of 1–3 C atoms,

... indicates that this bond is α,

◄ indicates that this bond is β, or, when R^1 is H, a physiologically acceptable salt thereof.

4,680,289

TREATMENT OF OBESITY AND DIABETES USING SAPOGENINS

Norman Applezweig, New York, N.Y., assignor to Progenics, Inc., New York, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,534

Int. Cl.[4] A61K *31/58*; C07J *71/00*

U.S. Cl. 514—172 **24 Claims**

1. A method of treating a condition selected from the group consisting of obesity and diabetes syndromes which comprises administering to a mammal an obesity or diabetes antagonizing effectuve amount of a 5β-sapogenin or a Δ^5 sapogenin.

4,680,290

STEROIDS FOR THE TREATMENT OF HYPERCHOLESTEROLEMIA

Jean-Marie Cassal, Mulhouse, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

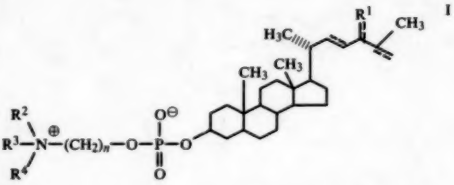
Filed Aug. 10, 1984, Ser. No. 639,543

Claims priority, application Switzerland, Aug. 25, 1983, 4644/83

Int. Cl.[4] A61K *31/56*; C07J *9/00*

U.S. Cl. 514—182 **24 Claims**

1. Steroids of the formula

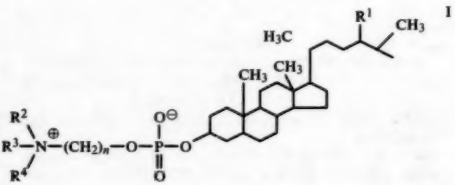


I

wherein n is 2,3 or 4; R^1 is hydrogen, or lower-alkyl; R^2, R^3 and R^4 are hydrogen or lower-alkyl and the dotted C—C bonds in the 5(6)-, 7(8)-, 22(23)-, and 25(26)-positions are optional, with the provisos that the B-ring contains only one double bond and the side-chain is either saturated, mono-unsaturated, or di-unsaturated in the 22(23) and 25(26)-positions; and with the further proviso that R^1 is lower-alkyl when a 5(6)-double bond is present, n is the number 2 and R^2, R^3 and R^4 are methyl,

and pharmaceutically acceptable salts of these steroids.

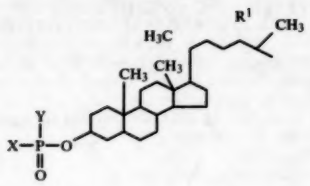
17. A process for the manufacture of a steroid of the formula



I

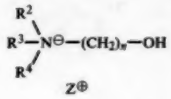
wherein n is 2,3 or 4; R^1 is hydrogen, or lower-alkyl; R^2, R^3 and R^4 are hydrogen or lower-alkyl and the dotted C—C bonds in the 5(6)-, 7(8)-, 22(23)-, and 25(26)-positions are optional, with the provisos that the B-ring contains only one double bond and the side-chain is either saturated, mono-unsaturated, or di-unsaturated in the 22(23) and 25(26)-positions; and with the further proviso that R^1 is lower-alkyl when a 5(6)-double bond is present, n is the number 2 and R^2, R^3 and R^4 are methyl,

or a pharmaceutically acceptable salt thereof, which process comprises reacting a compound of the formula



II

with a salt of the formula



wherein n, R^1, R^2, R^3, R^4 and the dotted C—C bonds are as hereinbefore defined; X and Y are chlorine, bromine or iodine or X and Y together are a 1,2-dimethylethylenedioxy residue and Z is lower-alkylsulphonyloxy, arylsulphonyloxy, perchloryloxy, chloro, bromo or iodo,
in the presence of a base and hydrolyzing the product.

4,680,291

PROPENYLAMINES, PROCESSES FOR THEIR PRODUCTION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Helmut Hamberger; Adrian Stephen, both of Vienna; Anton Stütz, Maria Enzersdorf, and Peter Stütz, Vienna, all of Austria, assignors to Sandoz Ltd., Basel, Switzerland

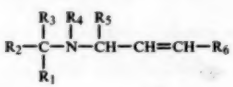
Filed Aug. 18, 1978, Ser. No. 934,772

Claims priority, application Switzerland, Aug. 19, 1977, 10203; Aug. 19, 1977, 10202; Sweden, Oct. 24, 1977, 12909; Switzerland, Oct. 24, 1977, 12910

Int. Cl.[4] R61K *31/135*

U.S. Cl. 514—183 **42 Claims**

1. A compound of formula I,

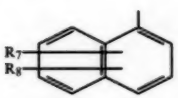


I

wherein

(a)

(i) R_1 is a radical of formula IIa,



IIa

wherein

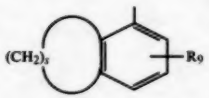
R_7 and R_8, independently, are hydrogen, halogen of atomic number from 9 to 53, trifluoromethyl, hydroxy, nitro, lower alkyl or lower alkoxy,

or a radical of formula IIb, IIc, IId, IIe,

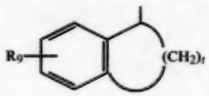
IIb

-continued

IIc



IId



IIe

wherein

R_9 is hydrogen, halogen of atomic number from 9 to 53, hydroxy, lower alkyl or lower alkoxy,

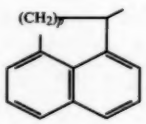
X is oxygen, sulphur, imino, lower alkylimino or a radical of formula $—(CH_2)_r—$ wherein r is 1, 2 or 3,

s is 3, 4 or 5, and

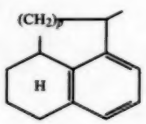
t is 2, 3 or 4, and

R_2 is hydrogen or lower alkyl, or

(ii) R_1 and R_2 together with the carbon atom to which they are bound form a radical of formula IIf or IIg,



IIf



IIg

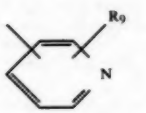
wherein

p is 1, 2 or 3,

R_3 and R_5, independently, are hydrogen or lower alkyl,

R_4 is alkyl (C_{1-6}), alkenyl (C_{3-12}), alkynyl (C_{3-12}) or cycloalkyl (C_{3-8})alkyl (C_{1-6}); and

R_6 is (i) an aromatic, five-membered heterocycle containing one oxygen, sulphur or nitrogen hetero-ring atom and optionally an additional one or two nitrogen hetero-ring atoms and being optionally substituted on a carbon ring atom by halogen of atomic number from 9 to 53, hydroxy, lower alkyl or lower alkoxy, and any nitrogen ring atom present being optionally substituted when possible, by lower alkyl, (ii) a radical of formula IIIa,

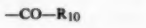


IIIa

wherein

R_9 is as defined above,

(iii) a radical of formula IIIb,

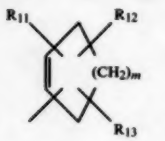


IIIb

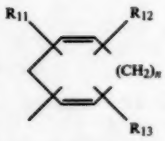
wherein

R_{10} is alkyl (C_{1-12}), alkenyl (C_{3-12}), alkynyl (C_{3-12}) cycloalkyl (C_{3-8})alkyl (C_{1-6}), phenyl-alkyl (C_{7-12}), phenyl, phenylalkoxy (C_{7-16}), or aminoalkyl (C_{1-12});

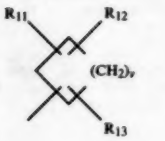
(iv) a radical of formula IIIc, IIId or IIIe,



IIIc



IIId



IIIe

wherein

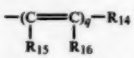
R_{11}, R_{12} and R_{13}, independently, are hydrogen or lower alkyl,

m is a whole number from 0 to 4,

n is a whole number from 0 to 3, and

v is a whole number from 0 to 5,

(v) a radical of formula IIIf,



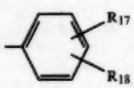
wherein

R_{14} is lower alkyl, alkoxy (C_{1-12})carbonyl, alkenyl (C_{3-12}), alkynyl (C_{3-12}), phenylalkyl (C_{7-12}) or phenyl,

R_{15} and R_{16}, independently, are hydrogen or lower alkyl, and

q is a whole number from 0 to 5, or

(vi) a radical of formula IIIg



IIIg

wherein

R_{17} and R_{18}, independently, are hydrogen, halogen of atomic number from 9 to 53, trifluoromethyl, hydroxy, nitro, lower alkyl or lower alkoxy, with the general proviso that R_1 is not a radical of formula IIa when R_6 is a radical of formula IIIg or phenyl or phenylalkyl,

(b)

R_1 is a radical of formula IIa to IIe, as defined above,

R_2, R_5 and R_6 are as defined above, and

R_3 and R_4 together are $-(CH_2)_u-$ wherein u is a whole number from 1 to 8.

or a chemotherapeutically acceptable salt thereof.

8. The compound according to claim 1 which is 4-[N-methyl-N-(1-naphthylmethyl)]aminocrotonic acid ethyl ester.

4,680,292

CARBAPENEMS AND 1-METHYLCARBAPENEMS HAVING A 2-HETEROARYLIUMALIPHATIC SUBSTITUENT

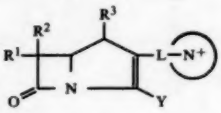
Burton G. Christensen, Cliffside; Thomas N. Salzmann, North Plainfield, and James V. Heck, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 13, 1984, Ser. No. 681,180

Int. Cl.[4] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 26 Claims

1. A compound having the formula:



(I.)

wherein:

R^3 is hydrogen or methyl;

R_1 and R_2 are independently H, CH_3, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, FCH_2—, F_2CH, F_3C—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

wherein

is a quaternary, monocyclic or bicyclic, substituted or unsubstituted heteroaryl group containing (a) when monocyclic, up to 3 heteroatoms and up to 6 total ring atoms or (b) when bicyclic up to 5 heteroatoms and 9–10 ring atoms, which is optionally substituted by one or more of the groups independently selected from

(1) a substituted or unsubstituted C_1–C_6 alkyl, C_2–C_6 alkenyl, C_5–C_7 cycloalkenyl, C_3–C_7 cycloalkyl, or (C_3–C_7 cycloalkyl)methyl;

(2) a substituted or unsubstituted C_3–C_7 heterocycloalkyl or (C_3–C_7 heterocycloalkyl)methyl having up to 3 hetero ring atoms;

(3) an unsubstituted or substituted phenyl or heteroaryl radical;

(4) an unsubstituted or substituted phenyl (C_1–C_4 alkyl) or heteroaryl (C_1–C_4 alkyl) radical;

(5) a trifluoromethyl or pentafluoroethyl group;

(6) a halogen atom;

(7) an unsubstituted or substituted C_1–C_4 alkoxy radical;

(8) a hydroxyl group;

(9) an unsubstituted or substituted (C_1–C_6 alkyl) carbonyloxy radical;

(10) a carbamoyloxy radical which is unsubstituted, monosubstituted or disubstituted on the nitrogen with a C_1–C_4 alkyl group;

(11) a C_1–C_6 alkylthio radical, C_1–C_6 alkylsulfinyl radical or a C_1–C_6 alkylsulfonyl radical each of which is unsubstituted or substituted in the alkyl group;

(12) a sulfo group;

(13) a sulfamoyl group which is unsubstituted, monosubstituted, or disubstituted on nitrogen with a C_1–C_4 alkyl group;

(14) an amino group;

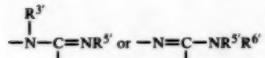
(15) a mono(C_1–C_4 alkyl) amino or di(C_1–C_4 alkyl) amino radical each of which is unsubstituted or substituted in the alkyl group;

(16) a formylamino group;

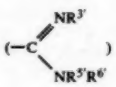
(17) an unsubstituted or substituted (C_1–C_6 alkyl) carbonylamino radical;

(18) a (C_1–C_4 alkoxy) carbonylamino radical;

(19) a ureido group in which the terminal nitrogen atom is unsubstituted or monosubstituted with a C_1–C_6 alkyl group;
(20) an arylsulfonamido or (C_1–C_6 alkyl) sulfonamido group;
(21) a cyano group;
(22) a formyl or acetalized formyl radical;
(23) an unsubstituted or substituted (C_1–C_6 alkyl) carbonyl radical wherein the carbonyl group is free or acetalized;
(24) an unsubstituted or substituted phenylcarbonyl or heteroarylcarbonyl radical;
(25) a hydroxyiminomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group;
(26) a carboxyl group;
(26a) a 5-tetrazolyl group;
(27) a (C_1–C_6 alkoxy) carbonyl radical;
(28) a carbamoyl radical which is unsubstituted, monosubstituted, or disubstituted on the nitrogen atom with a C_1–C_4 alkyl group;
(29) a N-hydroxy carbamoyl or N-(C_1–C_4 alkoxy) carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group;
(30) a thiocarbamoyl group;
(31) an amidino group



wherein $R^{3'}$, $R^{4'}$, $R^{5'}$, $R^{6'}$ are hydrogen, C_1–C_4 alkyl, or wherein two of the groups together form a C_3–C_6 alkylidine radical optionally interupted by a heteroatom and joined to either one or two nitrogen atoms to form a ring;
(32) a guanidino group in which $R^{4'}$ above is $NR^{5'}R^{6'}$;
(33) a carbamimidoyl group



wherein $R^{3'}$, $R^{5'}$ and $R^{6'}$ are as defined above;
(34) a cyano (C_1–C_4 alkyl) radical;
(35) a carboxy (C_1–C_4 alkyl) radical;
(36) a sulfo (C_1–C_4 alkyl) radical;
(37) a carbamoyl (C_1–C_4 alkyl) radical;
(38) a hydroxy (C_1–C_4 alkyl) radical;
(39) an amino (C_1–C_6 alkyl) radical which is unsubstituted, monosubstituted, or disubstituted on the nitrogen atom with C_1–C_4 alkyl groups; and
(40) a 5-tetrazoyl (C_1–C_4 alkyl) radical;

wherein the substituents in groups (7), (9), (11), (15), (17), (23), and (24) are selected from hydroxy, C_1–C_4alkoxy, mercapto, amino, mono- or di(C_1–C_4alkyl)amino, cyano, halo, CF_3, COOH, sulfo, carbamoyl, and sulfamoyl, and wherein the substituents in grous (1)–(4) are selected from those defined in groups (5)–(33).

L is a bridging group comprising substituted or unsubstituted C_1–C_4 straight, C_2–C_6 branched or C_3–C_7 cycloalkyl groups wherein the substituents are selected from C_1–C_6 alkyl, O—C_1–C_6 alkyl, S—C_1–C_6 alkyl, CF_3, N(C_1–C_6 alkyl)$_2$;

Y is
(i) —COOH, a pharmaceutically acceptable ester or salt thereof;
(ii) COOR wherein R is a removeable carboxy protecting group, e.g., p-nitrobenzyl, o-nitrobenzyl, benzyl, or allyl;
(iii) COOM wherein M is an alkali metal; or
(iv) COO^- provided that when Y is other than (iv) a counterion Z^- is present.

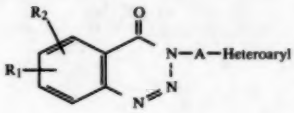
4,680,293

3-IMIDAZOLYLALKYL-, TRIAZOLYLALKYL-, PYRIDINYLALKYL-1,2,3-BENZOTRIAZIN-4(3H)-ONES AND DERIVATIVES THEREOF

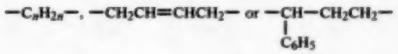
William B. Wright, Jr.; Andrew S. Tomcufcik, both of Bergen, N.J., and Joseph W. Marsico, Jr., Rockland, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 3, 1986, Ser. No. 835,501
Int. Cl.[4] A61K *31/53*; C07D *253/08*
U.S. Cl. 514—243 **20 Claims**

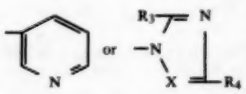
1. A compound selected from the group consisting of those of the formula:



wherein A is a divalent moiety of the formula:

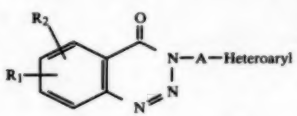


wherein n is an integer from 3 to 10, inclusive; R_1 and R_2 may be the same or different and may be selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkoxy having from one to four carbon atoms, alkyl having from one to four carbon atoms, nitro and amino; wherein Heteroaryl is

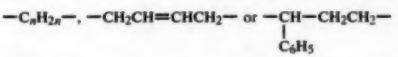


wherein R_3 and R_4 may be hydrogen, alkyl having from one to four carbon atoms or phenyl and X is CH or N; together with the pharmaceutically acceptable salts thereof.

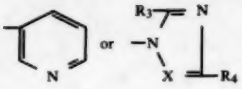
14. A method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal a thromboxane synthetase enzyme inhibiting amount of a compound selected from those of the formula:



wherein A is a divalent moiety of the formula:



wherein n is an integer from 3 to 10, inclusive; R_1 and R_2 may be the same or different and may be selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkoxy having from one to four carbon atoms, alkyl having from one to four carbon atoms, nitro and amino; wherein Heteroaryl is



wherein R_3 and R_4 may be hydrogen, alkyl having from one to four carbon atoms or phenyl and X is CH or N; together with the pharmaceutically acceptable salts thereof.

4,680,294

PESTICIDAL NOVEL NITROMETHYLENE DERIVATIVES

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

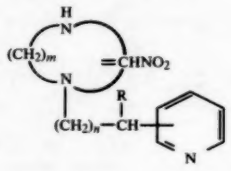
Division of Ser. No. 699,756, Feb. 8, 1985. This application Feb. 5, 1986, Ser. No. 826,433

Claims priority, application Japan, Feb. 16, 1984, 59-26020

Int. Cl.[4] A61K *31/395, 31/44;* **C07D** *401/06*

U.S. Cl. 514—256 **6 Claims**

1. A nitromethylene derivative of the formula



in which

R is a hydrogen atom or a lower alkyl group,

m is 3 or 4, and

n is 0, 1, 2 or 3,

or an insecticidally miticidally or nematocidally effective salt thereof.

5. A method of combating insects, mites or nematodes which comprises applying thereto or to a habitat thereof an insecticidally, miticidally or nematocidally effective amount of a nitromethylene derivative or salt thereof according to claim **1**.

4,680,295

OCTAHYDROPYRIDO[1,2-C]PYRIMIDINONES AND HEXAHYDROPYRIDO[1,2-C]PYRIMIDINEDIONES

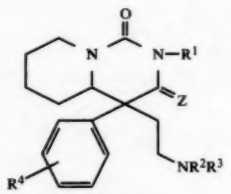
Kerry W. Fowler, Chicago, and Robert J. Chorvat, Lake Bluff, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 3, 1986, Ser. No. 825,723

Int. Cl.[4] C07D *471/04;* **A61K** *31/505*

U.S. Cl. 514—258 **27 Claims**

1. A compound of the formula:



and pharmaceutically acceptable acid addition salts,

wherein R^1 is:

(a) hydrogen;

(b) C_1–C_6 alkyl;

(c) C_2–C_6 hydroxyalkyl; or

(d) $-(CH_2)_n-Y$,

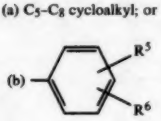
wherein

n is 1 or 2;

Y is:

(a) C_5–C_8 cycloalkyl; or

(b)



wherein

R_5 and R_6 independently are:

(a) hydrogen;

(b) C_1–C_6 alkyl;

(c) C_1–C_6 alkoxy; or

(d) halogen;

R^2 and R^3 are independently C_1–C_6 alkyl;

R^4 is:

(a) hydrogen;

(b) C_1–C_6 alkyl;

(c) C_1–C_6 alkoxy;

(d) halogen; or

(e) phenyl; and

Z is $=O$ or $=N-R^7$,

wherein

R^7 is:

(a) hydrogen; or

(b) C_2–C_6 alkanoyl.

26. A method for treating cardiac arrhythmia in mammals comprising administering a therapeutically effective amount of at least one compound of claim **1** to a mammal in need of such treatment.

4,680,296

PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Philippe Manoury, Verrieres le Buisson; Jean Binet, Breuillet, and Elisabeth Dewitte, St Gratien, all of France, assignors to Synthelabo, Paris, France

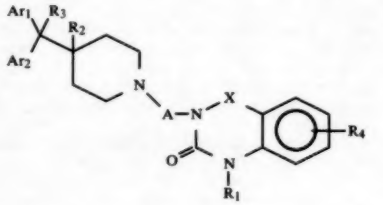
Filed Oct. 15, 1985, Ser. No. 787,971

Claims priority, application France, Oct. 16, 1984, 84 15847; Jul. 10, 1985, 85 10533; Jul. 10, 1985, 85 10534; Jul. 10, 1985, 85 10535

Int. Cl.[4] A61K *31/505;* **C07D** *401/04*

U.S. Cl. 514—259 **5 Claims**

1. Piperidine derivatives which are compounds of formula (I)



(I)

wherein Ar_1 and Ar_2 independently represent a phenyl group optionally substituted by a halogen atom, a thienyl group or a pyridinyl group, A represents an alkylene group of 2 to 6 carbon atoms, X represents a CO group or a bond, R_1 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, either R_2 represents a hydrogen atom and R_3 represents a hydrogen atom or a hydroxy group, or R_2 and R_3 together

represent a bond, and R_4 represents a hydrogen or halogen atom, or pharmaceutically acceptable acid addition salts thereof.

5. A pharmaceutical composition which contains, as active ingredient, an effective amount of a piperidine derivative as claimed in claim 1 in association with a pharmaceutically acceptable excipient.

4,680,297

TRICYCLIC POSITIVE INOTROPIC AGENTS

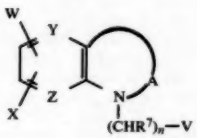
David J. Blythin, N. Caldwell, and Robert W. Watkins, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 513,544, Jul. 14, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,914

Int. Cl.[4] A61K *31/50, 31/495, 31/44*

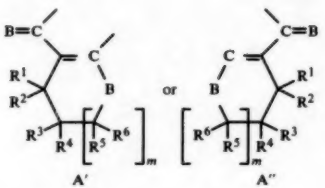
U.S. Cl. 514—293 **21 Claims**

1. A method for increasing cardiac contractility in a mammal which method comprises administering to said mammal a positive inotropic effective amount of a compound having the structural formula I



wherein:

A is



A′ A″

B is independently oxygen or sulfur;

R^1–R^6 may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms;

m is 0 or 1, provided that, when m is 0, R^2 and R^4 may be joined to form a carbon to carbon bond;

n is 0, 1 or 2;

W and X may be the same or different and are hydrogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, halogen, trifluromethyl, nitro, cyano, carboxy, hydroxy, alkenyloxy having from 3 to 8 carbon atoms, alkynyloxy having from 3 to 8 carbon atoms, cycloalkyl having from 4 to 8 carbon atoms, $S(O)_pR^a$ wherein p is 0, 1 or 2 and R^a is alkyl having from 1 to 6 carbon atoms, or phenoxy wherein the benzene ring may be substituted with any of the other substituents W and X;

Y and Z may be the same or different and are CH or N;

V is phenyl, naphthyl, idenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with W and X as defined herein; and

R^7 is independently hydrogen or alkyl having from 1 to 6 carbon atoms.

4,680,298

TRICYCLIC ANTI-ALLERGY AND USE AS ANTI-INFLAMMATORY AGENTS

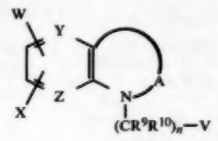
David J. Blythin, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 499,584, May 31, 1983. This application Apr. 9, 1984, Ser. No. 597,887

Int. Cl.[4] A61K *31/495, 31/435;* **C07D** *491/00, 455/04*

U.S. Cl. 514—293 **47 Claims**

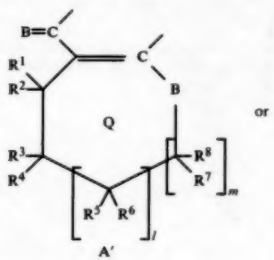
1. A compound having the structural formula I



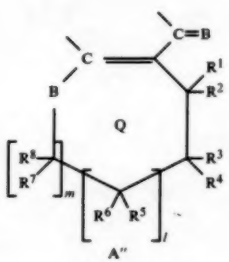
I

or pharmaceutically acceptable salts thereof, wherein

A is



A′



A″

B is independently oxygen or sulfur; R^1–R^8 may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms and two adjacent R^1–R^8 substituents may be combined to form an additional carbon to carbon bond;

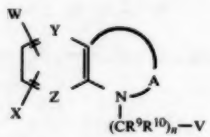
l and m may be the same or different and are 0 or 1;

the ring labeled, Q, may optionally contain up to two additional double bonds; n is 0, 1 and 2;

W and X may be the same or different and are hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having from 3 to 6 carbon atoms, $S(O)_pR^a$ {wherein p is 0, 1 or 2 and R^a is alkyl having from 1 to 6 carbon atoms}, $NHSO_2R^a$ {wherein R^a is as defined herein}, $NHSO_2CF_3$, $NHCOCF_3$, SO_2NH_2, COR^b {wherein R^b is OH, NH_2 or OR^a (wherein R^a is as defined herein)}, O-D-COR^b {wherein D is alkylene having from 1 to 4 carbon atoms and R^b is as defined herein}, or $NHCOR^c$ {wherein R^c is hydrogen, alkyl having from 1 to

6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, COR^d (wherein R^d is hydroxy or alkoxy having from 1 to 6 carbon atoms) or NHR^e (wherein R^e is hydrogen or alkyl having from 1 to 6 carbon atoms)}, or phenoxy {wherein the benzene ring may be substituted with any of the other substituents W and X}; Y and Z may be the same or different and are CH or N; V is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with W and X as defined herein; R^9 and R^{10} are independently hydrogen or alkyl having from 1 to 6 carbon atoms; and 2'-methylpyrano-5',6':3,4-(1-phenyl-2-2-oxo-1,2-dihydroquinoline) is excluded.

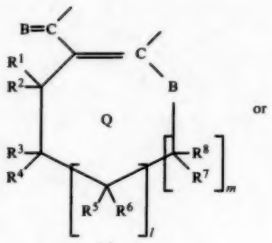
23. A pharmaceutical composition for treating allergic reactions which comprises a compound having the structural formula I



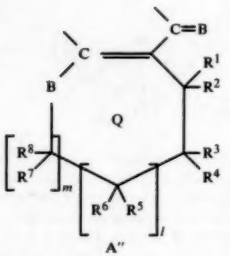
I

or pharmaceutically acceptable salts thereof, in combination with a pharmaceutically acceptable carrier, wherein

A is



or



B is independently oxygen or sulfur;

R^1–R^8 may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms and two adjacent R^1–R^8 substituents may be combined to form an additional carbon to carbon bond;

l and m may be the same or different and are 0 or one;

the ring labeled, Q, may optionally contain up to two additional double bonds;

n is 0, 1 and 2;

W and X may be the same or different and are hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynylocy having from 3 to 6 carbon atoms, $S(O)_pR^a$ {wherein p is 0, 1 or 2 and R^a is alkyl having from 1 to 6 carbon atoms}, $NHSO_2R^a$ {wherein R^a is as defined herein}, $NHSO_2CF_3$, $NHCOCF_3$, SO_2NH_2, COR^b {wherein R^b is OH, NH_2 or OR^a (wherein R^a is as defined herein)}, O-D-COR^b {wherein D is alkylene having from 1 to 4 carbon atoms and R^b is as defined herein}, $NHCOR^c$ {wherein R^c is hydrogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, COR^d (wherein R^d is hydroxy or alkoxy having from 1 to 6 carbon atoms) or NHR^e (wherein R^e is hydrogen or alkyl having from 1 to 6 carbon atoms)}, or phenoxy {wherein the benzene ring may be substituted with any of the other substitutents W and X};

Y and Z may be the same or different and are CH or N;

V is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with W and X as defined herein; and

R^9 and R^{10} are independently hydrogen or alkyl having from 1 to 6 carbon atoms.

4,680,299

2-PHENYL-4-QUINOLINECARBOXYLIC ACIDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

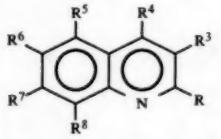
David P. Hesson, Wilmington, Del., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 605,104, Apr. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 516,319, Jul. 22, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,808

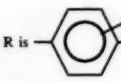
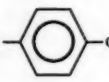
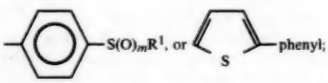
Int. Cl.[4] **C07D** *409/04, 215/16;* **A61K** *31/47*

U.S. Cl. 514—311 **22 Claims**

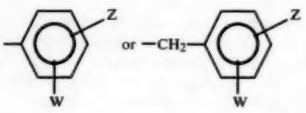
1. A compound having the formula:



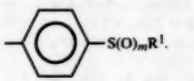
wherein

R is  ,  ,  ;

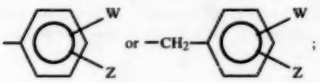
R^1 is cyclohexyl,



when R is

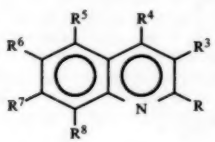


R^1 can be in addition alkyl of 3–4 carbon atoms;
R^2 is



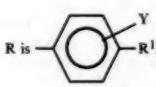
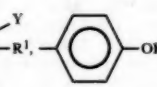
R^3 is H, alkoxy of 1–3 carbon atoms, or alkyl of 1–2 carbon atoms;
R^4 is CO_2H or CO_2R^{11};
R^5, R^6, R^7 and R^8 are independently H, F, Cl, Br, I, CH_3, CF_3, SCH_3 or CH_2CH_3, at least two of R^5, R^6, R^7, and R^8 being H;
R^9 and R^{9A} are independently H or alkyl of 1 to 3 carbon atoms;
R^{11} is $(CH_2)_{2-4}NR^9R^{9A}$;
W, Y and Z are independently H, F, Cl, Br, alkyl of 1–5 carbon atoms, NO_2, OH, CF_3 or OCH_3;
m is 0 or 1; or
a pharmaceutically suitable salt thereof;
with the following provisos:
(1) when R^4 is CO_2H, R^1 is phenyl or phenoxy, and R^5, R^7 and R^8 are H, R^6 cannot be Br;
(2) R^5, R^6 and R^7 cannot all be H;
(3) when R^4 is $CO_2CH_2CH_2N(CH_3)_2$, R^6 is CH_2CH_3, or R^7 is Cl, R^1 cannot be cyclohexyl;
(4) when R^1 is cyclohexyl and R^3 is H, R^6 must be Cl or F, but R^6 and R^8 cannot both be Cl; and
(5) when R^6 is CH_3, R^7 cannot be Cl.

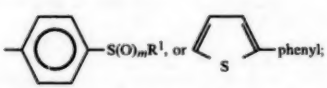
3. A pharmaceutical composition consisting essentially of a suitable pharmaceutical carrier and at least one compound having the formula:



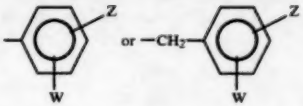
(I)

wherein

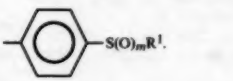
R is  ,  ,



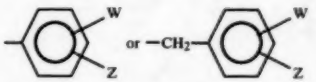
R^1 is $CH_3CH_2(CH_3)CH$, alkyl of 5–12 carbon atoms, cyclohexyl,



when R is



R^1 can be in addition alkyl of 3–4 carbon atoms;
R^2 is



R^3 is H, alkoxy of 1–3 carbon atoms, or alkyl of 1–2 carbon atoms;
R^4 is CO_2H or CO_2R^{11};
R^5, R^6, R^7 and R^8 are independently H, F, Cl, Br, I, CH_3, CF_3, SCH_3 or CH_2CH_3, at least two of R^5, R^6, R^7, and R^8 being H;
R^9 and R^{9A} are independently H or alkyl of 1 to 3 carbon atoms;
R^{11} is $(CH_2)_{2-4}NR^9R^{9A}$;
W, Y and Z are independently H, F, Cl, Br, alkyl of 1–5 carbon atoms, NO_2, OH, CF_3 or OCH_3;
m is 0 or 1; or
a pharmaceutically suitable salt thereof;
with the following provisos:
(1) R^5, R^6 and R^7 cannot all be H;
(2) when R^4 is $CO_2CH_2CH_2N(CH_3)_2$, R^6 is CH_2CH_3, or R^7 is Cl, R^1 cannot be cyclohexyl;
(3) when R^1 is cyclohexyl and R^3 is H, R^6 must be Cl or F, but R^6 and R^8 cannot both be Cl; and
(4) when R^6 is CH_3, then R^7 cannot be Cl.

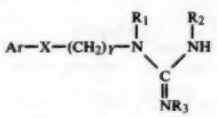
4,680,300

ANTI-INFLAMMATORY GUANIDINES

Peter Nelson, Los Altos, and Stefan H. Unger, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 10, 1985, Ser. No. 690,295
Int. Cl.[4] A61K *31/47, 31/155;* **C07C** *129/00*
U.S. Cl. 514—312 **21 Claims**

1. A compound having the formula



where
Ar is naphthyl, biphenyl, or quinolinyl;
X is oxygen or NH;
Y is 2 to 8;
R_1 is phenyl, substituted phenyl, hydrogen, or lower alkyl; and
R_2 and R_3 are each independently alkyl, cycloalkyl, phenyl, substituted phenyl, or thiazolyl;
or a pharmaceutically acceptable salt thereof.

19. A pharmaceutical composition having anti-inflammatory

activity or useful for the treatment of psoriasis which comprises an effective amount for the purpose intended of a compound of claim 1 and a pharmaceutically acceptable excipient.

4,680,301

6-ISOTHIOCYANATO-2,5-SUBSTITUTED BENZOTHIAZOLES OR BENZOXAZOLES USEFUL AS ANTHELMINTIC EFFECTIVE AGENTS

Vittal R. Rao, Bombay, India, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

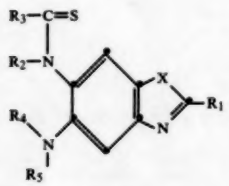
Filed Sep. 11, 1985, Ser. No. 774,776

Claims priority, application United Kingdom, Sep. 19, 1984, 8423697

Int. Cl.[4] A61K *31/435;* **C07D** *413/04, 417/04*

U.S. Cl. 514—321 **12 Claims**

1. A benzazole compound of the formula



(I)

wherein

X is sulphur or oxygen;

R_1 is lower alkyl or lower alkenyl;

R_2 is hydrogen;

R_3 is lower alkylthio which is unsubstituted or mono substituted by carboxy or esterified carboxy; or R_2 and R_3 together represents a bond; and

R_4 and R_5 are hydrogen or lower alkyl; or R_4 and R_5 together with the nitrogen to which they are attached, represents a member selected from the group consisting of pyrrolidino, piperidino, hexahydroazepino, octahydroazocino, morpholino, thiamorpholino, and piperazino which is unsubstituted or substituted on carbom atoms by lower alkyl or phenyl and said piperazino is N-unsubstituted or N-substituted by a substituent selected from lower alkyl, phenyl, lower alkanoyl, benzoyl, lower alkoxycarbonyl, and lower alkane sulphonyl;

or a salt thereof.

12. A method for the treatment of parasitic infections by helminths which comprises administering to a living body suffering from parasitic infections an effective amount of a compound of formula I as claimed in claim 1.

4,680,302

1-ALKYL-3-HYDROXY-3-PHENYLPIPERIDINES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Filed Jan. 29, 1986, Ser. No. 823,595

Claims priority, application France, Feb. 1, 1985, 85 01410; Jul. 10, 1985, 85 10550

Int. Cl.[4] C07D *211/42;* **A61K** *31/445*

U.S. Cl. 514—327 **3 Claims**

1. 1-Ethyl-3-hydroxy-3-phenylpiperidine and its addition salts.

3. A method of treatment of depression which comprises administering to a person in need of such a treatment an antidepressive effective amount of 1-ethyl-3-hydroxy-3-phenylpiperidine according to claim 1 or one of its non-toxic addition salts.

4,680,303

THIOFORMAMIDE DERIVATIVES AND USE IN INHIBITING GASTRIC SECRETION

Jean C. Aloup, Villeneuve-le-Roi; Jean Bouchaudon, Morsang-sur-Orge; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Nov. 18, 1985, Ser. No. 798,846

Claims priority, application France, Nov. 20, 1984, 8417648

Int. Cl.[4] C07D *409/00, 401/00;* **A61K** *31/44*

U.S. Cl. 514—336 **3 Claims**

1. N-Methyl-2-(6-methyl-2-pyridyl)-1,3-dithiane-2-carbothiamide.

3. Method of inhibiting gastric secretion which comprises administering to a subject in whom such inhibition is desired an effective amount of a thioformamide as claimed in claim 1.

4,680,304

FEED COMPOSITIONS CONTAINING 2-(α-PYRIDYL)-Δ^2-HETEROCYCLIC COMPOUNDS

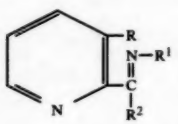
Govind K. Menon, Downingtown, Pa., and Winfred J. Sanders, Mt. Laurel, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Mar. 12, 1985, Ser. No. 710,791

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—340 **12 Claims**

1. An animal feed composition supplemented by a quantity of a compound of the formula:



in which:

R is hydrogen or hydroxy;

R^1 is hydrogen or, when also attached to R^2, methylene, oxa or aza; and

R^2 is hydroxylamino or, when taken together with R^1 and the imino to which it is attached, forms a five-membered heterocycle, wherein the five-membered heterocycle is Δ^2-imidazolinyl, Δ^2-oxadiazolinyl, Δ^2-thiadiazolinyl or Δ^2-triazolinyl, the heterocycle being optionally C-substituted with one or two methyl, carboxamido, hydroxy, carbomethoxy or carbethoxy groups;

or a nontoxic, stable salt thereof, which is effective for increasing the growth rate or feed efficiency of a meat producing monogastric animal but which is nontoxic to the animal.

4,680,305

USE OF SULPHONYLDIHYDROPYRIDINES AS MEDICAMENTS FOR THE TREATMENT OF ASTHMA

Egbert Wehinger, Wuppertal, Fed. Rep. of Germany, and Robertson Towart, Stoke Poges, United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

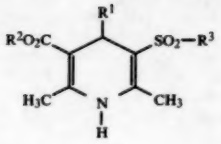
Filed Jan. 8, 1986, Ser. No. 816,937

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501695

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—347 **6 Claims**

1. A method of treating a patient suffering from asthma which comprises administering to such patient an asthma-relieving amount of a 5-sulphonyl-1,4-dihydropyridine of the formula



in which

R^1 is aryl having 6 or 10 C atoms, optionally substituted by 1 to 3 identical or different substituents selected from the group consisting of halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, alkoxycarbonyl having up to 4 C atoms, carboxyl, alkoxy having up to 4 C atoms or straight-chain or branched alkyl having up to 4 C atoms, or is pyridyl, thienyl, furyl or benzoxadiazolyl,

R^2 is straight-chain, branched or cyclic, saturated or unsaturated alkyl having up to 7 C atoms, which can be interrupted in the chain by 1 or 2 oxygen and/or sulphur atoms, and which is optionally substituted by halogen, nitro, cyano, carboxyl, alkoxycarbonyl with up to 4 C atoms, aryl having, 6 or 10 C atoms, or an amino group, it being possible for the amino group to carry 1 or 2 identical or different substituents from the group comprising alkyl with up to 4 C atoms, aryl having 6 to 10 C atoms or alkaryl having 7 to 10 C atoms,

R^3 is aryl having 6 to 10 C atoms which can optionally be substituted by 1 to 3 identical or different substitutents selected from the group consisting of halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, alkoxy having up to 4 C atoms, or dialkylamino, or is a straight-chain, branched or cyclic alkyl having up to 8 C atoms, which can optionally be substituted by cyano, halogen or nitro.

4,680,306

SPRIO-IMIDAZOLONES FOR TREATMENT OF DIABETES COMPLICATIONS

Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

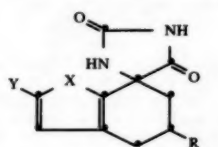
PCT No. PCT/US84/01155, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO86/00807, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 20, 1984, Ser. No. 842,109

Int. Cl.[4] A61K *31/415;* **C07D** *491/107, 495/10*

U.S. Cl. 514—389 **8 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein:

X is oxygen or sulfur;

Y is hydrogen, halo or alkyl having 1–4 carbon atoms; and

R is hydrogen, methyl or ethyl.

7. A method for treating diabetes complications in a mammal comprising administering an effective amount of a compound according to claim 1.

4,680,307

CARBACYCLIN ANALOGS

Masami Muraoka, Toyonaka; Toshio Nakamura, Nishinomiya; Akihiko Sugie, Toyonaka; Keiichi Ono, Osaka, and Michihiro Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

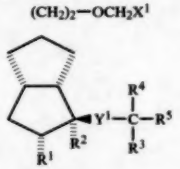
Filed Jan. 26, 1984, Ser. No. 574,125

Claims priority, application Japan, Feb. 1, 1983, 58-15837

Int. Cl.[4] C07C *59/62, 69/734, 69/78;* **C07D** *315/00;* **A61K** *31/185, 31/215, 31/235, 31/35*

U.S. Cl. 514—460 **43 Claims**

1. A compound of the formula:



wherein X^1 is a free carboxyl group or an esterified carboxyl group selected from the group consisting of C_1–C_4 alkoxycarbonyl, phenoxycarbonyl, naphthoxycarbonyl, benzyloxycarbonyl, phenethyloxycarbonyl, (C_1–C_4 alkoxy)methoxycarbonyl, (C_2–C_5 alkanoyloxy)methoxycarbonyl, (C_3–C_7 cycloalkyloxy)carbonyl, phenylcarbonylmethoxycarbonyl and (hydroxy C_1–C_4 alkoxy)carbonyl, Y^1 is a group of the formula:

(R^6 is a hydrogen atom or a C_1–C_4 alkyl group),

(R^6 is as defined above),

R^1 is a hydrogen atom, a hydroxyl group or a hydroxy group protected with C_1–C_4 alkanoyl, benzoyl, tetrahydropyranyl, tetrahydrofuryl or (C_1–C_4 alkoxy)methyl, R^2 is a hydrogen atom or R^1 and R^2, when taken together, mean a single linkage to form a double bond between the carbon atoms to which they are linked, R^3 is a hydroxyl group or a hydroxy group protected with C_1–C_4 alkanoyl, benzoyl, tetrahydropyranyl, tetrahydrofuryl or (C_1–C_4 alkoxy)methyl, R^4 is a hydrogen atom or a C_1–C_4 alkyl group, R^5 is a hydrogen atom, a C_1–C_{12} alkyl group, a C_2–C_{12} alkenyl group, a C_2–C_{12} alkynyl group, a C_3–C_{10} cycloalkyl group, a C_4–C_{10} cycloalkenyl group, a hydroxy C_1–C_{12} alkyl group, a phenyl group unsubstituted or substituted with a halogen atom, a hydroxyl group, a C_1–C_4 alkyl group, a trifluoromethyl group, or a C_1–C_4 alkoxy group or a group of the formula: A-B (A is a C_1–C_7 alkylene chain and B is a C_3–C_{10} cycloalkyl group, a C_4–C_{10} cycloalkenyl group, a C_1–C_{12} alkoxy group, a C_3–C_{10} cycloalkoxy group, a C_4–C_{10} cycloalkenyloxy group, or a phenyl or phenoxy group unsubstituted or substituted with a halogen atom, a hydroxy group, a C_1–C_4 alkyl group, a trifluoromethyl group or a C_1–C_4 alkoxy group); or a non-toxic pharmaceutically acceptable salt thereof.

41. The method of treating ulcers by administering to a patient an antiulcer effective amount of a compound as claimed in claim 1.

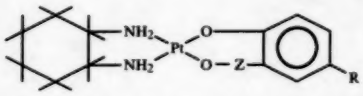
42. The method of treating thrombosis by administering to a patient an antithrombotic effective amount of a compound as claimed in claim 1.

4,680,308
STABLE SOLUBLE 1,2-DIAMINOCYCLOHEXANE PLATINUM COMPLEXES

Paul Schwartz, Rockville; Devinder S. Gill, Silver Spring, both of Md., and Kenneth J. McGrath, Manassas, Va., assignors to Andrulis Research Corporation, Bethesda, Md.

Filed Dec. 26, 1985, Ser. No. 813,451
Int. Cl.[4] C07F *15/00*
U.S. Cl. 514—492 **16 Claims**

1. A platinum complex of the formula



wherein Z is —CO— or a single bond and R is —COOH or —SO_3H, or a pharmaceutically acceptable salt thereof.

4,680,309
METHODS AND COMPOSITIONS FOR TREATING INFLAMMATION OR ARTHRITIS

Gerald L. Maurer, Fairfield, Ohio, assignor to National Research Laboratories, Cincinnati, Ohio

Continuation of Ser. No. 447,424, Dec. 6, 1982, abandoned. This application Feb. 3, 1986, Ser. No. 825,674
Int. Cl.[4] A01N *55/02*; A61K *31/30*
U.S. Cl. 514—499 **38 Claims**

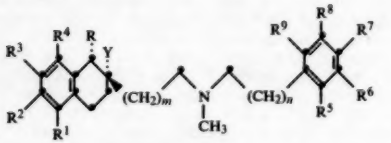
1. A method of alleviating an inflammatory disorder in an animal which comprises delivering to the site of the inflammation of said disorder an effective anti-inflammatory amount of a metal complex consisting of dialkali metal monoheavymetal chelate of an alpha or beta-hydroxy polycarboxylic acid.

4,680,310
TETRAHYDRONAPHTHALENE DERIVATIVES

Urs Hengartner, Basel, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

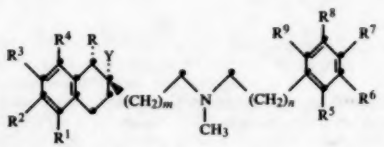
Filed Oct. 10, 1985, Ser. No. 786,253
Claims priority, application Switzerland, Oct. 11, 1984, 4870/84
Int. Cl.[4] H61K *31/24*; C07D *317/44, 319/14*; C07C *149/20, 69/00, 39/17, 43/18*; C07B *93/08*
U.S. Cl. 514—539 **36 Claims**

1. A compound of the formula



wherein R is hydrogen of lower-alkyl, R^1, R^2, R^3 and R^4 each independently is hydrogen, halogen or lower-alkoxy or two of R^1, R^2, R^3 and R^4 on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, R^5, R^6, R^7, R^8 and R^9 each independently is hydrogen, halogen, C_1–C_{10}-alkoxy, lower alkylthio, lower-alkoxy-lower alkoxy or ω,ω,ω-trifluoro-lower alkoxy or two of R^5, R^6, R^7, R^8 and R^9 on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, Y is hydroxy, lower-alkylcarbonyloxy, lower-alkoxy-lower-alkylcarbonyloxy, lower-alkoxy-carbonyloxy, lower-alkoxy-lower-alkoxycarbonyloxy, lower-alkylthio-lower-alkylcarbonyoxy or benzylcarbonyloxy optionally mono- or di-substituted on the benzene ring by lower-alkyl, lower-alkoxy, halogen or nitro, m is the number 1 or 2 and n is the number 1, 2 or 3, its optical antipode, or a racemate thereof, or a pharmaceutically acceptable acid addition salt thereof.

24. A composition for controlling high blood pressure containing an effective amount of a compound of the formula:



wherein R is hydrogen or lower-alkyl, R^1, R^2, R^3 and R^4 each independently is hydrogen, halogen or lower-alkoxy or two of R^1, R^2, R^3 and R^4 on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, R^5, R^6, R^7, R^8 and R^9 each independently is hydrogen, halogen, C_1–C_{10}-alkoxy, lower alkylthio, lower-alkoxy-lower-alkoxy or ω,ω,ω-trifluoro-lower-alkoxy or two of R^5, R^6, R^7, R^8 and R^9 on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, Y is hydroxy, lower-alkylcarbonyloxy, lower-alkoxy-lower-alkylcarbonyloxy, lower-alkoxy-carbonyloxy, lower-alkoxy-lower-alkoxycarbonyloxy, lower-alkylthio-lower-alkyl-carbonyloxy or benzylcarbonyloxy optionally mono- or di-substituted on the benzene ring by lower-alkyl, lower-alkoxy, halogen or nitro, m is the number 1 or 2 and n is the number 1, 2 or 3, its optical antipode or a racemate thereof or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier material.

4,680,311
METHOD FOR THE TREATMENT OF SYSTEMIC MYCOSIS

Naoharu Watanabe, Kounosu; Kazuo Numata, Ageo; Michio Yamagishi, Yoshimi; Taku Mizutani; Sadafumi Omura, both of Ageo, and Hideyo Yamaguchi, Kawasaki, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Apr. 7, 1986, Ser. No. 848,483
Claims priority, application Japan, Apr. 18, 1985, 60-81360
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—561 **2 Claims**

1. A method for the treatment of candidiasis in mammals which comprises administering (S)-2-amino-5-hydroxy-4-oxopentanoicacid in a therapeutically effective amount to said mammals suffering from candidiasis.

4,680,312
STABLE PROSTAGLANDIN E GELS UTILIZING COLLOIDAL SILICON DIOXIDE AS A GEL-FORMING AGENT

Brian S. Johnson, Crawley, United Kingdom, assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 613,006, May 21, 1984, abandoned, which is a continuation of Ser. No. 470,656, Feb. 28, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 674,357
Claims priority, application United Kingdom, Mar. 22, 1982, 8208322
Int. Cl.[4] A61K *31/19, 31/557*
U.S. Cl. 514—573 **1 Claim**

1. In a stable dosage form of PGE_2 consisting essentially of PGE_2 in triacetin, an improvement which comprises:

colloidal silicon dioxide (CSD) as a gel forming additive thereto in a concentration by weight of CSD in said stable dosage form from about not less than 8 percent to about not more than 15 percent.

4,680,313

ACCELERATION OF LIPID METABOLISM USING VANILLYLAMINE DERIVATIVES

Kazuo Iwai, Kyoto, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 742,317, Jun. 7, 1985, abandoned. This application Feb. 24, 1986, Ser. No. 834,102

Claims priority, application Japan, Jun. 11, 1984, 59-119460; Jun. 11, 1984, 59-119461; Dec. 26, 1984, 59-281691

Int. Cl.[4] A61K *31/16, 31/35*

U.S. Cl. 514—627 9 Claims

1. A method of accelerating lipid metabolism for reduction or prevention of accumulation of body fat in a subject, comprising:

administering to said subject a lipid metabolism accelerating amount of a vanillylamine derivative selected from the group consisting of vanillylamine, a vanillylamide derived from an unsaturated carboxylic acid wherein said acid has from 8 to 18 carbon atoms, or a vanillylamide derived from a saturated carboxylic acid wherein said saturated carboxylic acid has from 2 to 22 carbon atoms, in a food substance.

4,680,314

PROCESS FOR PRODUCING A NATURALLY-DERIVED CAROTENE/OIL COMPOSITION BY DIRECT EXTRACTION FROM ALGAE

Arthur M. Nonomura, Del Mar, Calif., assignor to Microbio Resources, Inc., San Diego, Calif.

Filed Aug. 30, 1985, Ser. No. 771,402

Int. Cl.[4] A61K *31/07, 31/355*

U.S. Cl. 514—725 20 Claims

1. A process for the production of a naturally-derived composition consisting essentially of carotene dissolved in edible oil, which comprises:

a. providing a slurry of carotene-containing algae suspended in water;

b. concentrating the algae at or near the surface of the water and thereafter removing a portion of the water to form a wet algal concentrate;

c. adding oil to the wet algal concentrate and homogenizing the mixture to form an oil/water emulsion and allowing said emulsion to exist for a time and at a temperature sufficient to extract the carotene from the algae into the oil by direct contact of the oil with the algae; and thereafter separating the oil phase containing the carotene from the water and recovering the naturally-derived composition consisting essentially of the oil containing carotene dissolved therein.

4,680,315

POWDER MIXTURE HAVING HIGH PROPYLENE GLYCOL CONTENT AND PROCESS FOR THE PREPARATION THEREOF

Denes Bezzegh; Karoly Magyar; Jozsef Kelemen; Gabor Zalai; Attila Mandi, and Janos Egri, all of Budapest, Hungary, assignors to EGYT Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Jan. 7, 1985, Ser. No. 689,222

Claims priority, application Hungary, Jan. 6, 1984, 2251-39/84

Int. Cl.[4] A61K *31/045*

U.S. Cl. 514—738 6 Claims

1. A method of incorporating propylene glycol into veterinary medicines and animal feeds which comprises: mixing propylene glycol with a solid carrier selected from the group consisting of magnesium oxide, magnesium peroxide and magnesium carbonate and mixtures thereof in a weight ratio of from 75 to 25% propylene glycol to 25 to 75% of solid carrier to form a powder mixture, and thereafter incorporating the mixture into the veterinary medicine or animal feed.

4,680,316

HOT APPLIED, EXPANDABLE SEALER

William A. Douglas, Richmond Heights, Mo., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 15, 1985, Ser. No. 787,343

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—89 5 Claims

1. A hot applicable, pumpable heat expandable, thermosetting sealing composition particularly adapted for use in the automotive industry comprising: about 10 percent to about 25 percent by weight of styrene-butadiene rubber, about 5 percent to about 20 percent by weight of thermoplastic resins is an aliphatic or aromatic hydrocarbon resin having a melting point from about 32° F.(0° C.) to about 248° F.(120° C.), about 0.5 percent to about 3 percent by weight of an accelerator activator, to about 0.2 percent by weight to about 0.75 percent by weight of a vulcanzing agent, about 25 percent by weight to about 35 percent by weight of a plasticizer, about 20 percent by weight to about 60 percent by weight of filler, about 0.5 percent by weight to about 2 percent by weight of a blowing agent, about 1 percent to about 10 percent by weight of a thickening agent about 4 percent to about 40 percent by weight of an oil or plasticizer, said composition having a sulfonamide accelerator present at concentrations of about 0.5 percent to about 3.0 percent by weight,

wherein the sealing composition can be applied to the surface of the structure to be sealed at an elevated temperature and after cooling to below about 100° F. can withstand the high pressure spraying of automotive cleansing tanks without being dislodged and will expand and cure upon exposure to paint curing processes.

4,680,317

MOLDING COMPOSITION FOR CROSSLINKED FOAM MATERIAL FROM POLYOLEFINS AND ETHYLENE-PROPYLENE ELASTOMER, AND PROCESS FOR THE PRODUCTION OF THE FOAM MATERIAL

Werner Kühnel, Neunkirchen-Schoneshof, and Paul Spielau, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 408,769, Aug. 17, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 727,739

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132439

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—89 18 Claims

1. An expandable molding composition for the production of a crosslinked foam material that has a predominantly closed cell structure with an average pore size of not more than 500 μm and that is a mixture consisting essentially of polyethylene and a partially crystalline ethylene-propylene terpolymer, and a blowing agent, in the presence of a crosslinking agent, the amount of the terpolymer in said composition, per 100 parts by weight of polyethylene, being 25–150 parts by weight, and said terpolymer having a tensile strength at break of at least 8.0N/mm^2, a Mooney viscosity (ML 1+4/100) larger than 50, with a melting heat (according to DSC) ΔH_s of at least 10 J/g, and a content of 60–80% by weight of ethylene, 10–38% by weight of propylene and 2–10% of a non-conjugated diene tercomponent of ethylidene norbornene or 1,4-hexadiene.

4,680,318

FOAMING RESIN COMPOSITION

Masaki Fujii; Shiroh Gotoh; Hideaki Nakagawa, and Ryoichi Ito, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

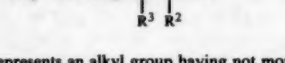
Filed Nov. 7, 1986, Ser. No. 928,040

Claims priority, application Japan, Nov. 14, 1985, 60-255698; Nov. 14, 1985, 60-255699

Int. Cl.[4] C08J 9/10

U.S. Cl. 521—95 16 Claims

1. A foaming resin composition comprising an unsaturated random copolymer consisting of from 85 to 99.4 mol % of propylene, from 0.5 to 14 mol % of ethylene, and from 0.1 to 10 mol % of a branched 1,4-diene represented by the formula (I):



(I)

wherein R^1 represents an alkyl group having not more than 8 carbon atoms; and R^2 and R^3 each represents a hydrogen atom or an alkyl group having not more than 8 carbon atoms, provided that R^2 and R^3 do not simultaneously represent a hydrogen atom, and a chemical foaming agent, said chemical foaming agent being employed in an amount of from 0.1 to 30% by weight based on the total weight of the composition.

4,680,319

ACCELERATED CROSSLINKING OF POLYOLEFINS GRAFTED WITH SILANES

Franco Gimpel, Via F. Nullo 18, 20129 Milano, and Corrado Brichta, Milan, both of Italy, assignors to Franco Gimpel, Milan, Italy

Continuation-in-part of Ser. No. 566,300, Dec. 28, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,212

Claims priority, application Italy, Dec. 12, 1983, 24121 A/83; Apr. 27, 1984, 20702 A/84

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] C08K 3/34

U.S. Cl. 523—210 14 Claims

1. A composition crosslinkable by exposure to irradiation with electromagnetic microwaves or to water in liquid or vapor phasse, which comprises an olefin polymer having grafted thereon an unsaturated silane containing hydrolyzable groups, and 0.1 to 20% of a hydrated, partially dehydrated or dehydrated zeolite in powder form based on the weight of the olefin polymer.

4,680,320

METHOD FOR PREPARATION OF DROPLETS

Kyouji Uku, and Shinji Kato, both of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1985, Ser. No. 805,523

Claims priority, application Japan, Dec. 6, 1984, 59-258572

Int. Cl.[4] C08F 2/18

U.S. Cl. 523—313 6 Claims

1. A method of preparing droplets without forced vibration wherein a dispersion phase insoluble or sparingly soluble in an aqueous continuous phase is injected in the form of a laminar flow into the continuous phase through an orifice, the method being characterized in that when the viscosity of the dispersion phase is μ' and the viscosity of the continuous phase is μ, the viscosity ratio μ'/μ between the two phases is adjusted to the range of from 0.9 to 4 to produce droplets having a uniform diameter without using forced vibration.

4,680,321

AGGLOMERATION

Everett S. Graham, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Nov. 4, 1985, Ser. No. 794,374

Claims priority, application Canada, Nov. 26, 1984, 468636

Int. Cl.[4] C08J 3/06; C08L 9/04, 9/08, 9/10

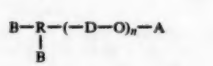
U.S. Cl. 523—335 9 Claims

1. A process for agglomerating the particles of a latex of a synthetic polymer derived from monomers comprising at least about 60 percent of a monomer selected from the group consisting of butadiene, isoprene and a mixture thereof; and not more than 40 percent of a monomer selected from the group consisting of styrene, α-methyl styrene, p-methyl styrene, chlorostyrene, vinyl chloride, vinylidene chloride, acrylonitrile and a mixture thereof, stabilized at a pH of greater than 9 with a pH sensitive emulsifier which comprises:

(i) adjusting the pH of the latex to from about 7.7 to about 9.5 with a weak acid;

(ii) adding to the latex

(a) from about 0.01 to about 1.0 parts by weight per 100 parts by weight of polymer of an agglomerating agent of the formula



wherein

R is an organic hydrophobic radical,

A is H or a radical of the formula $R—(—D—O)_mH$,

B is H or (D—O)qH

D is a C_{2-5} alkylene radical,

m, n and q are integers from 23 to about 455; and

(b) from about 0.01 to about 5 parts per 100 parts of polymer solids of a dispersing agent,

(iii) maintaining the latex at a temperature from about 20 to less than 40° C. for a period of time from about 2 to 6 hours so as to agglomerate the polymer particles of the latex;

(iv) adjusting the pH of the agglomerated latex to above 9.5.

4,680,322

COMPOSITION FOR FORMING A LAYER OF THE SUPPORTING PLATE FOR USE IN LITHOGRAPHY AND PROCESS FOR PRODUCING THE COMPOSITION

Yuzo Yokota, Otsu; Kanji Noma, Osaka; Kiyotaka Kawase, Kusatsu; Hironori Kitamura, Nagaokakyo, and Masayuki Kamigaito, Takatsuki, all of Japan, assignors to Nippon Foil Mfg, Co., Ltd., Osaka, Japan

Filed Nov. 4, 1985, Ser. No. 794,846

Claims priority, application Japan, Nov. 5, 1984, 59-233845; Jun. 24, 1985, 60-138817

Int. Cl.[4] C08L 0/63, 5/04; G03C 1/76

U.S. Cl. 523—416 21 Claims

1. A composition for forming a layer (A) of a supporting plate (B) for use in lithography, comprising (I) an aqueous solution containing (1) methylolmelamines and (2-1) polyvinyl alcohol, zirconium nitrate and a hardening catalyst of said methylolmelamines or (2-2) an epoxy compound, and (II) a water-insoluble inorganic powdery material dispersed in said aqueous solution.

4,680,323

METHOD AND COMPOSITION FOR THE PREPARATION OF CONTROLLED LONG-ACTING PHARMACEUTICALS FOR ORAL ADMINISTRATION

Hans Lowey, 1045 Nine Acres La., Mamaroneck, N.Y. 10543

Filed Dec. 1, 1983, Ser. No. 556,844

Int. Cl.[4] A61K 9/22, 9/26; C08L 1/26

U.S. Cl. 524—43 26 Claims

1. A sustained release pharmaceutical carrier suitable for admixture with active ingredients comprising:

(a) 5.5–98.5% by weight of hydroxypropyl methylcellulose;
(b) 0.25–4.5% by weight of hydroxypropyl cellulose;
(c) 1–90% by weight of a carboxyvinyl polymer.

10. A sustained release pharmaceutical composition which comprises a carrier and an active therapeutic agent incorporated within said carrier, said carrier comprising:
(a) 5.5–98.5% by weight of hydroxypropyl methylcellulose;
(b) 0.25–4.5% by weight of hydroxypropyl cellulose;
(c) 1–90% by weight of a carboxyvinyl polymer.

4,680,324

FIRE-RETARDANT PLASTICS WITH GLYCOSIDE ADDITIVE

Nelson E. Malwitz, Brookfield, Conn., assignor to Sealed Air Corporation, Danbury, Conn.

Filed Aug. 23, 1985, Ser. No. 768,611
Int. Cl.[4] C08K *50/07, 3/32, 3/10*
U.S. Cl. 524—58 **17 Claims**

1. A plastic composition having fire-retardant properties, said composition comprising a melt producable plastic composition, a fire-retardant compound comprising at least one member selected from the group consisting of antimony compounds, phosphorous compounds, chlorine compounds and bromine compounds, and a glycoside.

4,680,325

ANTI-OXIDANT ISOCYANURATE ESTER OF THIOAMIDOPHENOL AND POLYOLEFINS STABILIZED THEREWITH

Neil Dunski; Ali A. Bazzi, both of Creve Coeur, and Henry J. Buehler, St. Louis, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 692,078, Jan. 17, 1985, Pat. No. 4,569,959. This application Feb. 10, 1986, Ser. No. 827,988
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[4] C07D *251/34;* **C08K** *5/34;* **C08J** *5/34*
U.S. Cl. 524—101 **5 Claims**

1. As a new compound 1,3,5-tris-(2-hydroxyethyl-[2-mercapto-(3′,5′-di-tert-butyl-4′-hydroxypropionanilide)-]acetate)isocyanurate.

2. A composition of matter comprising a polyolefin normally subject to oxidative deterioration and a stabilizing amount of the compound of claim **1**.

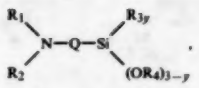
4,680,326

POLY(ARYLENE SULFIDE) COMPOSITION WITH IMPROVED INSULATION RESISTANCE AND CRACKING RESISTANCE

John E. Leland; James S. Dix, and Roy F. Wright, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 723,985, Apr. 16, 1985, abandoned. This application Jul. 29, 1986, Ser. No. 892,722
Int. Cl.[4] C08K *5/54, 5/34, 5/16*
U.S. Cl. 524—106 **33 Claims**

1. A composition comprising:
(a) in the range of about 30 to about 80 weight percent poly(arylene sulfide), based on the total weight of the composition,
(b) a reinforcing material,
(c) in the range of about 0.5 to about 10 weight percent low density polyethylene, based on the total weight of the composition, and
(d) at least one organosilane represented by the general formula:



where
R_1 and R_2 are individually selected from the group consisting of hydrogen, alkyl, alkaryl, aminoalkyl, carboxyalkylaminoalkyl, aryl, aralkyl, carbamoyl, hydroxyalkyl, and vinylaralkylaminoalkyl grops containing 1 to 10 carbon atoms, and where R_1 and R_2 also may be joined by a valance bond to form a cyclic structure of from 5 to 16 atoms including the nitrogen atom therein, R_3 and R_4 are individually selected from the group consisting of alkyl and cycloalkyl groups containing 1 to 6 carbon atoms, Q is a divalent hydrocarbon radical containing from 1 to 18 carbon atoms, and y is 0, 1, or 2,
wherein said composition provides an electrical insulation resistance of at least 1.0×110^9 ohms, and said composition provides good crack resistance.

4,680,327

STABILIZERS

Albert Hettche, Hessheim; Stefan Weiss, Neckargemuend; Hubert Trauth, Dudenhofen; Peter Lechtken, Frankenthal, and Michael Horner, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,744
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3504981
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] C08K *5/15*
U.S. Cl. 524—110 **3 Claims**

1. A stabilizer for plastics which contains
(a) 2,5,7,8-tetramethyl-2-(2′-stearyloxyethyl)chroman and
(b) glyceryl monostearate, glyceryl tri-12-hydroxystearate, a partial ester of stearic acid with a condensate of trimethylolpropane and glycerol in a molar ratio of from 1:10 to 10:1, triglyceryl stearate, tetraglyceryl stearate, or a mixture of these stearates, the weight ratio of (a) to (b) being from 1:10 to 10:1.

3. A plastic containing from 0.05 to 1% by weight, based on the plastic, of a stabilizer as claimed in claim **1**.

4,680,328

INSECT RESISTANT POLYETHYLENE COMPOSITION SUITABLE FOR WIRE AND CABLE APPLICATIONS

Gregory L. Dohrer, Clute, and George W. Knight, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 676,341, Nov. 29, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 806,904
Int. Cl.[4] C08K *5/53*
U.S. Cl. 524—137 **19 Claims**

1. A composition suitable for forming into and use as electrical cable jacketing, electrical junction boxes or drip irrigation tubing, and having resistance to attack from insects for an extended period of time, consisting essentially of:
(a) at least about 75 weight percent polyethylene having a melt index from about 0.01 to about 100 and a density from about 0.900 to about 0.975 g/cc, said polyethylene selected from the group consisting of low density polyethylene, high density polyethylene, linear low density polyethylene, and combinations thereof;
(b) from about 5 to about 25 weight percent of a compatibility additive selected from the group consisting of: chlorinated polyethylenes containing from about 10 to about 50 percent by weight chlorine and having a viscosity of about 5,000–40,000 Pa-s at 190° C. and a shear rate of

145/sec.; ethylene-n-butyl acrylate copolymers having a melt flow value of about 0.5–2000 and containing from about 10 to about 50 weight percent n-butyl acrylate; and combinations thereof; and

(c) an insecticidally effective amount, up to about 8 weight percent of an insecticide selected from halopyridyl phosphates.

4,680,329

BLENDS OF POLYPHENYLENE ETHERS WITH PHOSPHORUS-CONTAINING POLYMERS

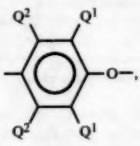
Sterling B. Brown, and Dennis J. McFay, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,626
Int. Cl.[4] C08L *7/04*
U.S. Cl. 524—143 **27 Claims**

1. A resinous composition obtained by preparing a blend comprising a major proportion of

(A) at least one polyphenylene ether selected from the group consisting of:

(1) those comprising structural units having the formula



(II)

wherein each Q^1 and each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl wherein at least two carbon atoms separate the halogen atom from the benzene ring, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and

(2) graft copolymers thereof:

or a blend thereof with at least one polystyrene, and minor proportions of

(B) at least one hydrocarbon polymer characterized by the presence within its molecular structure of 0.4–1.8% by weight of phosphorus as groups having the formula

(I)

wherein X^1 is oxygen or sulfur; R^1 is lower alkyl or X^2R^3; X^2 is O, S or NR^4; each of R^2 and R^3 is independently H, one equivalent of a metal or ammonium cation, lower alkyl, halo-substituted lower alkyl or silyl; and R^4 is hydrogen or lower alkyl; and

(C) at least one fatty acid salt.

2. A composition according to claim 1 wherein R^1 is X^2R^3, each of X^1 and X^2 is oxygen and each of R^2 and R^3 is a cation or lower alkyl, and component C is a zinc salt of a saturated fatty acid.

3. A composition according to claim 2 wherein the polyphenylene ether is a poly(2,6-dimethyl-1,4-phenylene ether) having a number average molecular weight of about 5,000–40,000.

6. A composition according to claim 3 wherein there is additionally blended into said composition (D) at least one additional plasticizer, said plasticizer being a polar material melting at least 50° C. below the processing temperature of the resinous components of the composition.

9. A composition according to claim 6 wherein component A is a blend of said polyphenylene ether with a polystyrene, said blend containing about 10–90% by weight polyphenylene ether.

4,680,330

STRETCHABLE CLING FILM COMPOSITION BASED ON POLYETHYLENE

Bernard Berrier, Chateauneuf les Martigues, and Jean P. Thiersault, Ville D'Avray, both of France, assignors to BP Chemicals Limited, London, England

Filed Dec. 12, 1985, Ser. No. 807,975
Claims priority, application France, Dec. 28, 1984, 84 19979
Int. Cl.[4] C08K *5/01, 5/20;* **C08L** *23/00, 91/06*
U.S. Cl. 524—230 **7 Claims**

1. A composition based on ethylene polymer and suitable for the manufacture of stretchable cling film characterised in that the composition comprises from 80 to 99% by weight of at least one homopolymer or copolymer of ethylene having a density less than or equal to 0.935, and a total of from 1 to 20% by weight, based on the total composition of components (a) and (b) comprising

(a) at least one cling agent selected from liquid polybutene, polyisobutene having a number average molecular weight in the range 500 and 10000 and an atactic polypropylene having a weight average molecular weight in the range 500 and 50000, and

(b) at least one crystalline wax having one or more melting points, (as determined by differential scanning calorimetry) between 50° and 200° C. and a number average molecular weight between 250 and 15000 and wherein the quantity of the crystalline wax lies in the range 0.1% to 10% by weight of the total weight of (a) and (b) together.

4,680,331

AQUEOUS COATING COMPOSITION OF FLUOROCARBON RESIN

Takeshi Suzuki, Nagaokakyo; Shigetake Tominaga, Ibaraki, and Masanori Nakai, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 758,240, Jul. 24, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 832,622
Claims priority, application Japan, Jul. 25, 1984, 59-154969
Int. Cl.[4] C08K *5/54*
U.S. Cl. 524—269 **7 Claims**

1. A fluorocarbon resin aqueous coating composition comprising:

(a) a fluorocarbon resin, and based on the amount by weight of the resin

(b) about 1 to about 10% by weight of a silicone emulsion (calculated as silicone oil contained),

(c) about 1 to about 40% by weight of a flaky inorganic material, and

(d) about 3 to about 10% by weight of a nonionic surfactant, or a mixture of nonionic surfactant and anionic surfactant,

the composition containing about 25 to about 75% by weight of water based on the whole composition.

4,680,332

INK JET COMPOSITIONS AND PROCESS FOR PREPARATION THEREOF

Michael L. Hair, Oakville; Kar P. Lok, Sarnia; Christopher K. Ober; Melvin D. Croucher, both of Oakville, and Raymond W. Wong, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 24, 1986, Ser. No. 822,173
Int. Cl.[4] C08K *5/05, 5/06*
U.S. Cl. 524—377 **18 Claims**

1. A heterophase ink jet composition comprised of a water insoluble polymer dispersed in a liquid medium selected from the group consisting of water, an alcohol, wherein the polymer contains therein an solvent soluble dye and a nonionic stabilizer permanently attached to the polymer, and mixtures of water and an alcohol; and wherein the resulting ink composi-

tion has a surface tension of from about 45 to about 65 dynes/cm.

4,680,333

REMOVABLE HOT MELT PRESSURE SENSITIVE ADHESIVE

Irwin J. Davis, Bridgewater, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 14, 1986, Ser. No. 852,005

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—394 13 Claims

1. A removeable pressure sensitive hot melt adhesive composition consisting essentially of:

(a) 25 to 50% by weight of an A-B-A block copolymer where the A component is styrene or a homologue thereof and the B component is isoprene;

(b) 20 to 50% by weight of a substantially aliphatic hydrocarbon resin having a softening point less than about 30 C;

(c) 0 to 30% by weight of a substantially aliphatic hydrocarbon resin having a softening point of about 80 to 150 C;

(d) 0 to 25% by weight of mineral oil or petrolatum;

(e) 0.25 to 3% by weight of a metallic salt of a C_{14} to C_{19} fatty acid; and

(f) 0.2 to 2% of an antioxidant.

4,680,334

FLAME RETARDANT POLYMER COMPOSITIONS CONTAINING MOLYBDENUM COMPOUNDS AND SULFUR-CONTAINING POLYMERS

Lawrence R. Wallace, Evansville, Ind., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1985, Ser. No. 780,365

Int. Cl.[4] C08K *3/32, 3/30, 3/28, 3/26, 3/24, 3/22*

U.S. Cl. 521—406 9 Claims

1. Flame retardant compositions comprising chlorosulfonated polyethylene together with at least one resin selected from the group consisting of chlorinated polyethylene and polyvinyl chloride, wherein the chlorosulfonated polyethylene is present at a concentration such that the sulfur content of the total polymer composition is at least 0.1 parts per hundred resin, in combination with molybdenum in sufficient concentration to provide flame suppression, wherein the molybdenum is provided by molybdenum oxides and molybdenum containing salts selected from the group consisting of halides, phosphates, carbonates, oxyhalides, halide hydrates, acetates, nitrates, sulfides, chromates and molybdates.

4,680,335

POLYMER COMPOSITIONS

Pauline B. Chambers; Stephen W. Bedder, and Paul J. Akers, all of Coventry, United Kingdom, assignors to Courtaulds PLC, United Kingdom

Filed Mar. 18, 1986, Ser. No. 840,855

Claims priority, application United Kingdom, Mar. 20, 1985, 8507221

Int. Cl.[4] C08J *3/02;* C08K *3/20*

U.S. Cl. 524—501 8 Claims

1. An aqueous polymer latex composition which is a stable blend of two aqueous polymer latices (A) and (B), said latices (A) and (B) each comprising polymer particles having a polymeric core formed by emulsion polymerisation of one or more olefinically unsaturated monomers and a polymeric shell formed on the core by emulsion polymerisation of one or more olefinically unsaturated monomers in the presence of the core, the polymeric shell of the emulsion polymer particles of latex (A) containing functional groups capable of reacting with functional groups in the polymeric shell of the emulsion polymer particles of latex (B) to cause cross linking between the particles of the two latices.

4,680,336

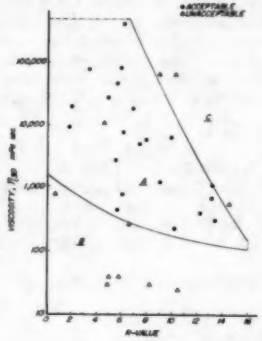
METHOD OF FORMING SHAPED HYDROGEL ARTICLES

Hans O. Larsen, Farum, and Ture Kindt-Larsen, Vedbaek, both of Denmark, assignors to Vistakon, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 673,805, Nov. 21, 1984. This application Feb. 19, 1985, Ser. No. 703,009

Int. Cl.[4] B29D *11/00*

U.S. Cl. 524—548 23 Claims



1. In the method of preparing shaped hydrogel articles by forming a polymerization mixture comprising one or more hydrophilic monomers, a cross-linking agent, and from about 20 to 95% by volume of a inert water displaceable diluent, polymerizing said mixture in substantially the desired configuration of the shaped hydrogel article to obtain a shaped gel of a hydrophilic polymer and said diluent, and thereafter replacing said diluent with water to obtain said shaped hydrogel article, the improvement comprising employing as said diluent an organic compound or mixture of compounds having a viscosity and R-value falling within Area A of FIG. I, said viscosity being from about 100 to 500,000 M Pa sec at 30° C., and said R-value being from 0 to about 16 as determined by the Hansen cohesion parameters for the diluent and the polymer according to the following equation

$$R=[(\delta_{p1}-\delta_{p2})^2+(\delta_{h1}-\delta_{h2})^2]^{0.5}$$

wherein δ_{p1}, δ_{h1} respectively are Hansen polar and hydrogen bonding cohesion parameters for the polymer, and δ_{p2}, δ_{h2}, are the corresponding parameters of the diluent.

4,680,337

TRANSPARENT IMPACT POLYMERS

Harry A. Biletch, Lexington; Richard A. Di Manno, and Robert J. Gorka, both of Leominster, all of Mass., assignors to Polysar Financial Services S.A., Fribourg, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,375

Int. Cl.[4] C08F *287/00*

U.S. Cl. 525—53 8 Claims

1. A process for the preparation of a thermoplastic composition having good toughness and strength properties and a high degree of transparency, which process comprises the step of providing a feed mixture comprising (a) from about 25 to about 75 parts by weight of a styrenic monomer selected from the group consisting of styrene, p-methyl styrene, tertiary butyl styrene, dimethyl styrene and the nuclear brominated or chlorinated derivatives thereof, (b) from about 7 to about 30 parts by weight of butyl acrylate, (c) from about 10 to about 50 parts by weight of methyl methacrylate and from about 2 to about 20 parts by weight of a block copolymer selected from the group consisting of diblock and triblock copolymers of styrene-butadiene, styrene-butadiene-styrene, styrene-isoprene, sty-

rene-isoprene-styrene, partially hydrogenated styrene-butadiene-styrene and partially hydrogenated styrene-isoprene-styrene linear or radial block copolymers having a weight average molecular weight of not less than about 75,000 and a styrene content of from about 20 to about 50 weight percent, for a total of 100 parts by weight of said feed mixture, subjecting said feed mixture to polymerization in (i) an agitated reaction vessel at about 80° to about 100° C. for a time of from about 3 to about 6 hours and (ii) at least one and up to five further reaction vessels in series at about 100° to about 160° C. for a time of from about 2 to about 6 hours such that from about 60 to about 90 weight percent of the polymerizable monomers have been polymerized, passing the so-polymerized mixture to a devolatilization system comprising a devolatilization preheating means and a devolatilization vessel to remove unpolymerized monomers, to yield a thermoplastic composition.

4,680,338

BIFUNCTIONAL LINKER

Boby M. Sundoro, West Orange, N.J., assignor to Immunomedics, Inc., Newark, N.J.

Filed Oct. 17, 1985, Ser. No. 788,284
Int. Cl.[4] C07G 7/02; C08K 3/30; A61F 13/04
U.S. Cl. 525—54.1 **21 Claims**

1. A selective bifunctional sequential linker having the formula

$$Y{=}C{=}N{-}Q{-}A{-}C(O){-}Z$$

wherein Q is a homoaromatic or heteroaromatic ring system; A is a single bond or an unsubstituted or substituted divalent C_{1-30} bridging group; Y is O or S; and Z is Cl, Br, I, N_3, N-succinimidyloxy, imidazolyl, 1-benzotriazolyloxy, OAr where Ar is an electron-deficient activating aryl group, or OC(O)R where R is —A—Q—N=C=Y or C_{4-20} tertiary-alkyl.

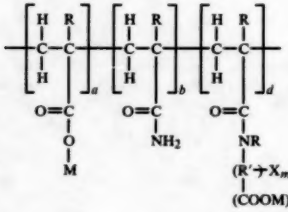
4,680,339

CARBOXYLATE CONTAINING MODIFIED ACRYLAMIDE POLYMERS

Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 24, 1986, Ser. No. 831,964
Int. Cl.[4] C08F 8/40, 8/32
U.S. Cl. 525—54.11 **8 Claims**

1. A process to synthesize water-soluble carboxylated polymers having randomly repeated mer units represented by the formula:

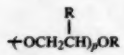


wherein

M is chosen from hydrogen, lower alkyl (C_1–C_4) groups, alkali metal, alkaline earth metal, primary, secondary or tertiary amine salts, quaternary amines and ammonium ion, and mixtures thereof;

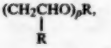
R′ is a multi-covalent hydrocarbonaceous bridging group having from one to sixteen carbon atoms and being chosen from linear alkyl, branched alkyl, cyclic, aromatic, aralkyl, alkaryl, heterocyclic and olefinic groups;

X is chosen from —SO_3M— PO_3M_2, —COOR, —OR, —R′NR″$_2$, —R′N⁺R_3Hal



wherein

R″ is



R and mixtures thereof, and

R is individually chosen, at each occurrence, from H and lower alkyl (C_1–C_4) groups;

and wherein

a, b, and d are integers with the following relationships;

a/b is from zero to 100

b/d is from 0.01 to 100

a/d is from zero to 100,

and the sum of a+b+d is sufficient to provide a molecular weight of at least 1000,

and the ratio of d:(a+b) is from 20:1 to 1:100;

and wherein

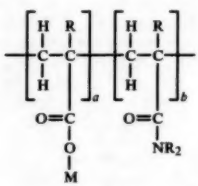
p ranges between 1 and 16, and

m ranges between 0 and 16, and

n ranges between 1 and 16, provided that when m is zero, the sum of m+n is from 1 to 20;

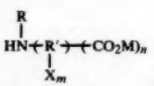
which process comprises reacting, in a common solvent, at a temperature of at least 100° C.;

A. a polymer having a molecular weight of at least 500, and having pendant amide functional groups, and represented by the structure:



wherein R, M, a, b have the same meanings as above; with

B. a chemical reactant having the structure:



wherein R, R′, M, X, m, and n have the meanings above; wherein the mole ratio of chemical reactant to pendant amide groups in the polymer ranges between about 5:1 to about 1:100; and reacting for an effective amount of time to accomplish at least a 2 percent conversion of chemical reactant to carboxylated pendant groups on the polymer; and then recovering the water-soluble carboxylated polymer.

4,680,340

EASY TO OPEN PACKAGE AND A METHOD OF MAKING SAME

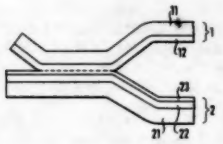
Aurelio Oreglia, Mozzate; Paolo Botto, and Claudio Freschi, both of Milan, all of Italy, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Nov. 29, 1985, Ser. No. 803,032

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504463

Int. Cl.[4] C08L *51/04, 33/02, 33/04*

U.S. Cl. 525—72 4 Claims



1. A seal layer for an easy to open package consisting essentially of

(a) 40% or less, by weight, of a first polymer having a melt flow index of less than 5 selected from the group consisting of ionomers and ethylene/vinly acetate cpolymers, and

(b) 60% or more by weight of a second polymer having a melt flow index greater than 20 being selected from the group consisting of low density polyethylene, ethylene/-vinyl acetate copolymers, and modified ethylene/vinyl acetate copolymers, whereby the second polymer is a low density polyethylene if the first polymer is an ethylene/vinyl acetate copolymer.

4,680,341

EPOXY RESINS BASED ON TETRAGLYCIDYL DIAMINES

Richard H. Newman-Evans, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

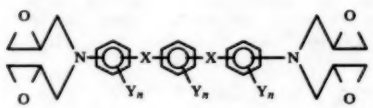
Filed Apr. 17, 1986, Ser. No. 853,052

Int. Cl.[4] C08G *59/28*

U.S. Cl. 525—113 33 Claims

1. A tetraglycidate of the formula

(I)



wherein

X=O, S,

—CH_2—, C=O;

Y=halogen, C_1–C_4 alkyl; and

n=0 to 4.

4,680,342

FLAME RESISTANT ALKENYL AROMATIC COMPOUNDS AND POLYMERS CONTAINING CHEMICALLY BONDED PHOSPHORUS AND BLENDS WITH POLYPHENYLENE ETHER

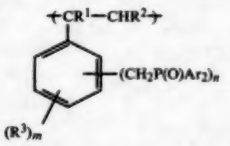
Robert J. Axelrod, Glenmont, and Glenn D. Cooper, deceased, late of Delmar, by Rose H. Cooper, executrix, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 566,341, Dec. 28, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,448

Int. Cl.[4] C08F *8/00, 130/02;* C08L *71/04*

U.S. Cl. 525—132 9 Claims

1. A flame retardant polymer comprising units of the formula



in which R^1 and R^2 are independently selected from the group consisting of alkyl having from 1 to 6 carbon atoms, alkenyl having from 1 to 6 carbon atoms, and hydrogen; R^3 is selected from the group consisting of alkyl having from 1 to 6 carbon atoms, alkenyl having from 1 to 6 carbon atoms, halogen and hydrogen; Ar is selected from the group consisting of monocarbocylic and dicarbocyclic aromatic radicals unsubstituted and substituted with up to 5 substituents selected from among halogen and alkyl having from 1 to 3 carbon atoms; m is zero or a whole number from 1 to 3; and n is a whole number from 1 to 3.

4,680,343

CHLORINATED POLY(VINYL CHLORIDE) THERMOPLASTIC ALLOYS

Biing-lin Lee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1986, Ser. No. 844,639

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—148 20 Claims

1. A thermoplastic high impact polymer alloy composition; comprising:

from about 20% to about 70% by weight of a chlorinated poly(vinyl chloride) containing from 57% to about 75% by weight of chlorine therein;

from about 10% to about 80% by weight of an aromatic polycarbonate;

an effective amount of an ethylene-based functional polymer so that the polymer alloy has an Izod notch impact strength of at least 1.0 ft-lb/in;

wherein said alloy amount is based upon the total weight of said chlorinated poly(vinyl chloride), said polycarbonate, and said ethylene-based functional polymer, and wherein said polymer alloy has a melt processing temperature of 230° C. or less.

4,680,344

BLENDS OF IONOMERS AND LINEAR POLYESTERS

James N. Coker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 730,052, May 3, 1985, abandoned. This application Mar. 26, 1986, Ser. No. 844,125

Int. Cl.[4] C08L *33/02*

U.S. Cl. 525—176 4 Claims

1. A composition consisting essentially of

(a) about 60–85% of an ionomer consisting of a direct copolymer of 80–95% of ethylene and 5–20% of an α,β-unsaturated carboxylic acid selected from the group con-

sisting of acrylic acid and methacrylic acid, no third comonomer being present, and the carboxylic acid groups being neutralized to the extent of 5–80% with zinc ions, said ionomer having a notched Izod impact resistance at −20° C. of at most 1040 J/m; and

(b) about 15–40% of polyethylene terephthalate having an inherent viscosity of about 0.2 to 1.5;

all the percentages being by weight.

4,680,345

CONTINUOUS PRODUCTION OF ELASTIC POLYESTERS

Takuma Kobayashi, Otsu; Hironobu Kitagawa, Shiga; Noritsugu Kaneshige, Hirakata, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1986, Ser. No. 867,646

Claims priority, application Japan, Jun. 5, 1985, 60-122294; Jul. 30, 1985, 60-169175

Int. Cl.[4] C08G *63/76*

U.S. Cl. 525—437 **14 Claims**

1. A process for producing an elastic polyester wherein a crystalline aromatic polyester and one or plurality of lactones are reacted, said process comprises by carrying out the reaction in a continuous process by continuously feeding the molten crystalline aromatic polyester and the lactones to a reaction vessel to subject them to addition polymerization.

4,680,346

FLEXIBLE PRIMER COMPOSITION AND METHOD OF PROVIDING A SUBSTRATE WITH A FLEXIBLE MULTILAYER COATING

Dennis W. Carson, Lower Burrell; Robert J. Schmitt; Carl A. Seneker, both of Pittsburgh, all of Pa.; Thomas A. Van Kuren, and David R. Wallace, both of Dublin, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 13, 1985, Ser. No. 808,762

Int. Cl.[4] C08L *63/00*; B05D *3/02*

U.S. Cl. 525—486 **17 Claims**

1. A coating composition comprising an organic polyol, a polyepoxide, a blocked polyisocyanate crosslinking agent and a phenolic resin.

4,680,347

THERMOSETTABLE POLYSTYRYLPYRAZINE POLYMERS TERMINATED WITH ETHYLENICALLY UNSATURATED GROUPS AND CURED PRODUCTS THEREFROM

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 726,555, Apr. 23, 1985, Pat. No. 4,629,770. This application Mar. 17, 1986, Ser. No. 840,243

Int. Cl.[4] C08L *61/20*

U.S. Cl. 525—519 **35 Claims**

1. A product resulting from subjecting to conditions sufficient to effect curing to a thermoset condition, a composition comprising

(I) a N,N′-bis-imide and

(II) a thermosettable product which results from reacting

(A) a pyrazine compound containing at least two substituent groups which have at least one hydrogen atom attached to a carbon atom which is attached to the ring or mixture of such pyrazines;

(B) at least one material having at least two aldehyde groups or a mixture containing at least one material having at least two aldehyde groups and at least one material having only one aldehyde group; and

(C) at least one of

(1) a nitrogen containing aromatic heterocyclic compound containing at least one hydrogen atom attached to a carbon atom attached to the ring and a polymerizable unsaturated group;

(2) an aldehyde containing at least one polymerizable unsaturated group; or

(3) a combination thereof;

and wherein components (II-A), (II-B) and (II-C) are employed in quantities which provide a molor ratio of components (II-B):(II-C):(II-A) of from about 0.25:0.25:1 to about 4:4:1.

4,680,348

EPOXY RESINOUS VARNISH ITS PREPARATION AND COATING COMPOSITION CONTAINING THE SAME

Haruhiko Satoh; Hisaki Tanabe, both of Yawata, and Hirotoshi Umemoto, Uji, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 16, 1984, Ser. No. 661,331

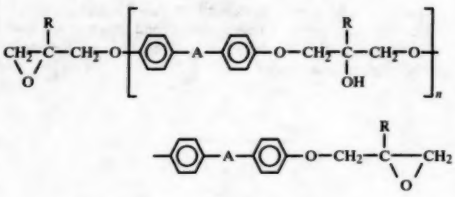
Claims priority, application Japan, Oct. 17, 1983, 58-1954540; Oct. 17, 1983, 58-1954541; Feb. 6, 1984, 59-19590; Feb. 8, 1984, 59-22488

Int. Cl.[4] C08G *59/08, 59/14*; C08L *63/04*

U.S. Cl. 525—528 **4 Claims**

1. A primer coating composition comprising as essential components, 50 to 95 parts by weight of a heat curing epoxy resin prepared by the interaction of product obtained by the reaction of

(a_1) an epoxy resin component composed of 50 to 100% by weight of a resin having the formula:



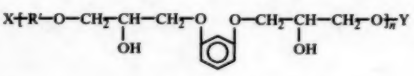
wherein R is H or CH_3—, —A— represents $>C(CH_3)_2$, $—CH_2—$, —O—, —S— or $—SO_2—$, and n is 0 or an integer of 1 to 14, and 50 to 0% by weight of another epoxy resin,

(a_2) a dicarboxylic acid, and

(a_3) a secondary amine having at least one primary hydroxyalkyl group, and product obtained by the reaction of

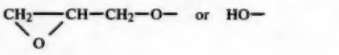
(b_1) a polyisocyanate compound, and

(b_2) an isocyanate blocking agent, the ratio of isocyanate groups in (b_1) to active hydrogen atoms in (b_2) being 5/1 to 5/4 and the ratio of primary hydroxyl groups in product to free isocyanate groups in product being 10/1 to 1/1; 50 to 5 parts by weight of a polyether resin having the formula:



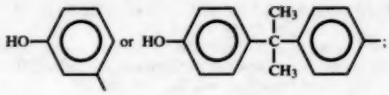
wherein

X represents

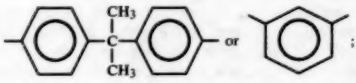


and

Y represents



and wherein
R′ is



n′ is 0 or an integer of 1 to 14; and
1 to 30 parts by weight of crosslinking agent other than product [B].

4,680,349

METHOD OF POLYMERIZING VINYL MONOMERS WITH COATED REACTOR

Tetsuya Asahi; Hiroshi Kaneko; Yasushi Sakai; Akio Kiyohara, and Tooru Iwashita, all of Yokkaichi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-Nanyo, Japan

Filed Jan. 2, 1986, Ser. No. 815,515
Claims priority, application Japan, Jan. 14, 1985, 60-3329; Feb. 13, 1985, 60-24344
Int. Cl.[4] C08F *2/20*
U.S. Cl. 526—62 3 Claims

1. A method of polymerizing vinyl type monomers characterized in that, upon the polymerization of vinyl type monomers in aqueous medium, reaction products of phenolic compounds with liquid polybutadiene or are coated beforehand onto the inside face of polymerization reactor to conduct the polymerization of vinyl type monomers aforementioned.

4,680,350

PURIFIED CATALYST SUPPORT

Carl C. Greco, Garnerville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 300,774, Sep. 10, 1981, Pat. No. 4,382,019. This application Jan. 31, 1983, Ser. No. 462,252
Int. Cl.[4] C08F *4/02, 10/00*
U.S. Cl. 526—125 24 Claims

1. A process for polymerizing olefins employing a catalytic system comprising:
(a) a component containing titanium chloride obtained by:
(i) activating a support material consisting essentially of a magnesium chloride by-product derived from the reaction of a haloalkyl with magnesium metal, with an electron donor to make an activated product, and
(ii) treating the activated product with a titanium halide component, and
(b) a compound containing an organoaluminum compound, wherein said support material, which contains about 5 percent or more magnesium metal, is pretreated with an active hydrogen compound in order to transform substantially the elemental magnesium to the magnesium salt of the active hydrogen compound.

4,680,351

SUPPORTED POLYOLEFIN CATALYST COMPONENTS AND METHODS OF MAKING AND USING SAME

Nemesio D. Miro, North Brunswick, N.J.; Floyd E. Farha, Bartlesville, Okla., and Charles E. Capshew, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 773,164, Sep. 6, 1985, Pat. No. 4,626,519. This application Oct. 10, 1986, Ser. No. 917,749
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 526—125 24 Claims

1. A process for polymerizing at least one olefin having from 2 to 18 carbon atoms which comprises contacting said olefin under polymerization conditions with a catalyst system which comprises
(a) a catalyst prepared by the process comprising
(1) co-comminuting an aluminum halide; at least one electron donor; a Group IVB–VIB transition metal compound; and a support base selected from the group consisting of the Group IIA and IIIA salts and the salts of the multivalent metals of the first transition series with the exception of copper to produce a coground solid;
(2) extracting said coground solid with an organic liquid; and
(3) separating the solid from the liquid under such conditions that at least 5 weight percent of the aluminum in the coground solid is removed characterized in that the extraction and the separation are conducted at a temperature below the boiling point of the lowest boiling portion of the organic liquid used in the extraction but in the range of about 70° C. to about 100° C.; and
(b) an organometallic cocatalyst.

2. A process according to claim 1 wherein there is additionally present with said cocatalyst an organic electron donor.

3. A process according to claim 1 wherein said aluminum halide is aluminum trichloride and said support base is magnesium dichloride.

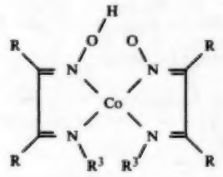
4,680,352

COBALT (II) CHELATES AS CHAIN TRANSFER AGENTS IN FREE RADICAL POLYMERIZATIONS

Andrew H. Janowicz, and Lester R. Melby, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

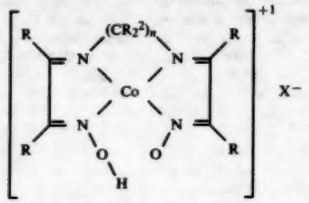
Continuation-in-part of Ser. No. 707,367, Mar. 1, 1985, abandoned. This application Jan. 27, 1986, Ser. No. 821,322
Int. Cl.[4] C08F *2/40*
U.S. Cl. 526—147 13 Claims

1. In an improved free radical polymeriation of acrylic and/or styrene monomers wherein molecular weight control is effected by means of a chain transfer agent, the improvement characterized in that the chain transfer agent is a cobalt chelate of the formula

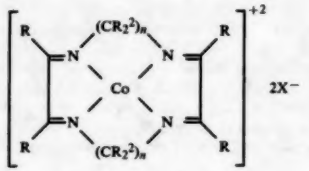


(IV)

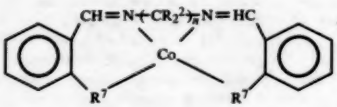
-continued



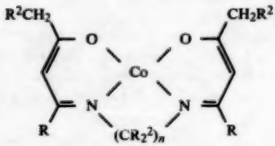
(VI)



(VII)



(VIII)



(IX)

wherein each R, independently, is phenyl or C_1 to C_{12} alkyl wherein each a-carbon atom contains two hydrogen atoms, or R and R on adjacent carbon atoms, taken together, is C_5 to C_8 cycloalkylene, unsubstituted in the a-positions; R^2 is H or C_xH_{2x+1} wherein x is 1 to 12; each R^3, independently, is H or C_1 to C_{12} branched or straight alkyl; R^7 is 0 or NH; n is 2 or 3; and X^- is NO_3^-, Cl^-, Br^-, I^-, BF_4^-, PF_6^-, SbF_6^- or R^1COO^- wherein R^1 is C_1 to C_{12} alkyl; provided, however, each of either or both aromatic rings in VIII optionally is substituted with a benzo group and optionally contains up to four substituents.

4,680,353

PROCESS FOR PRODUCTION OF STYRENE POLYMERS

Nobuhide Ishihara; Masahiko Kuramoto, both of Sodegaura, and Michitake Uoi, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 923,395

Claims priority, application Japan, Nov. 11, 1985, 60-252531; May 6, 1986, 61-101927

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—160 **3 Claims**

1. A process for producing styrene polymers which comprises polymerizing styrene or styrene derivatives by the use of a catalyst comprising:

(A) a titanium compound, and

(B) a contact product of an organoaluminum compound and a condensation agent.

4,680,354

LOW MOLECULAR WEIGHT POLYMERS AND COPOLYMERS

Ju-Chui Lin, Strongsville, and Kirk J. Abbey, Seville, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed May 21, 1986, Ser. No. 865,555

Int. Cl.[4] C08F *4/06*

U.S. Cl. 526—172 **11 Claims**

1. A process for producing a low molecular weight polymer comprising copolymerizing ethylenically unsaturated monomers comprising a methacrylic monomer or a mixture of methacrylic and acrylic monomers, polymerized alone or with other ethylenic monomer in the presence of an effective amount of free-radical initiator in combination with 0.1 ppm to 5,000 ppm, basis monomer weight, Cobalt(II) nitrilomethylidyne dipyrrole complex catalyst comprising a Cobalt(II) nitrilomethylidyne dipyrrole complex modified by a basic ligand selected from the group consisting of amines, trisubstituted phosphines, and imidazole to produce a low molecule weight methacrylic polymer having a weight average molecular weight between 200 and 30,000.

4,680,355

PROCESS FOR PREPARATION OF FLUORINE CONTAINING POLYMER FILMS

Akihiko Nakahara, Kumage; Kuniaki Takata, and Yuji Iseki, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Continuation of Ser. No. 710,851, Mar. 12, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 891,060

Claims priority, application Japan, Mar. 12, 1984, 59-45398; Mar. 22, 1984, 59-53499

Int. Cl.[4] B05D *3/02*

U.S. Cl. 526—243 **18 Claims**

1. A process for the preparation of flourine-containing polymer films having a multi-layer structure, which comprises flow-casting a fluorine-containing vinyl monomer, which is liquid under polymerization conditions, in the form of film having a thickness of from 10μ to 1 mm, polymerizing the flow-cast monomer in the presence of a gas phase having a fluorine-containing olefin to form a polymer, flow-casting a fluorine-containing vinyl monomer, which is liquid under polymerization conditions, in the form of a film having a thickness of from 10μ to 1 mm on the so-formed polymer and polymerizing the newly flow-cast monomer in the presence of a gas phase having a fluorine-containing olefin, each so-formed polymer layer containing 5 to 95 mole % of the fluorine-containing olefin units.

4,680,356

COLORLESS LIGAND-RELEASING MONOMERS AND POLYMERS AND THEIR USE TO PROVIDE DYES WITH METAL IONS

William N. Washburn, Ionia, and Kenneth R. Hollister, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 688,224, Jan. 2, 1985, Pat. No. 4,577,998. This application Aug. 9, 1985, Ser. No. 764,152

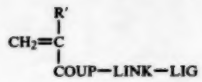
Int. Cl.[4] C08F *28/06, 226/06, 234/02*

U.S. Cl. 526—256 **5 Claims**

1. An essentially colorless, hydrophilic ligand-releasing polymer comprising:

(a) recurring units derived from an ethylenically unsaturated polymerizable hydrophilic monomer in a number sufficient to render said polymer hydrophilic, and

(b) recurring units derived from an ethylenically unsaturated polymerizable monomer represented by the structure:



wherein R′ is hydrogen or lower alkyl,
LINK is —COO—, —CONH—, —O—, —S—, —SO_2O— or —SO_2NH— COUP is a photographic color coupling moiety which can be cleaved from LINK by an oxidized developer composition, and
LIG is a ligand capable of complexing with metal ions, while joined to said polymer, to form a dye.

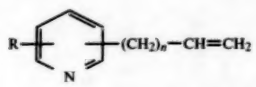
4,680,357

INTERPOLYMERS OF ETHYLENE AND ALKENYL PYRIDINES AND PREPARATION THEREOF

David P. Flores; John G. Meiller, and James D. Massie, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1985, Ser. No. 737,989
Int. Cl.[4] C08F *26/06*
U.S. Cl. 526—265 **38 Claims**

1. An interpolymer exhibiting utility as an adhesive to metallic substrates, consisting essentially of:
(a) from about 93 to about 97 mole percent ethylene on an interpolymer basis; and
(b) interpolymerized therewith, from about 3 to about 7 mole percent on an interpolymer basis of an alkenyl pyridine having the formula:



wherein n is 0 or an integer from 1 to about 10, R is hydrogen, ω-alkenyl having 2–12 carbon atoms, hydroxyl, amino, carboxyl, cyano, formyl, sulfo, halo, benzyl, benzoyl, phenyl, alkoxy, hydroxyalkyl, aminoalkylene, α-alkanoyl-ω-alkenyl, or alkyl having 1–10 carbon atoms.

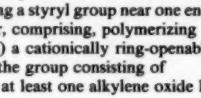
4,680,358

STYRYL TERMINATED MACROMOLECULAR MONOMERS OF POLYETHERS

Simon H. Yu, North Ridgeville, Ohio, assignor to The B F Goodrich Company, Akron, Ohio

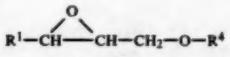
Filed Nov. 8, 1985, Ser. No. 796,364
Int. Cl.[4] C07C *41/03, 43/23, 43/178;* C08F *220/20, 116/16*
U.S. Cl. 526—292.9 **14 Claims**

1. A process for the manufacture of a polyether macromer having a styryl group near one end and a hydroxyl group at the other, comprising, polymerizing
(A) a cationically ring-openable cyclic ether selected from the group consisting of
(i) at least one alkylene oxide having the structure



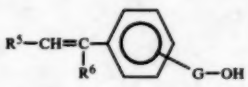
(I)

wherein,
x is an integer in the range from 0 to about 4, except that when x>1, a second alkylene oxide having x=1 or 0 must be present, and,
R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, C_1–C_{20} alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, C_6–C_{20} aryl and aralkyl, and, at least one of R^1, R^2, and R^3 is hydrogen; and,
(ii) an aliphatic or aromatic glycidyl ether having the structure



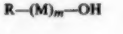
(II)

wherein R^1 has the same connotation as hereinabove; and, R^4 represents a member selected from the group consisting of C_1–C_{20} alkyl or substituted alkyl, haloalkyl, alkoxyalkyl, aryl (Ar), substituted aryl (Ar-Q), wherein Q represents C_1–C_{10} alkyl, haloalkyl; and,
(B) a monoolefinically ("styrylically") unsaturated primary or secondary alcohol represented by the structure



(III)

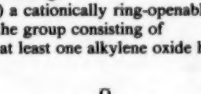
wherein,
G, if present, is in an ortho-, meta-, or para- position of the phenyl ring which may be substituted, said position being relative to that of the olefinically unsaturated group, and is a spacer selected from the group consisting of branched or linear alkyl, aralkyl, haloalkyl, haloaralkyl, alkoxyl, haloalkoxyl, aralkoxyl and haloaralkoxyl, each having from 1 to about 20 carbon atoms (C_1–C_{20}); and,
R^5 and R^6 are selected from from the group consisting of hydrogen, C_1–C_{10} alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, at least one of R^5 and R^6 is always H;
in the presence of an effective amount of
(C) a cationic initiator selected from the group consisting of Friedel-Crafts acids, relatively strong protic organic and inorganic acids, oxonium salts and stable carbenium ions;
so as to produce a macromer having the structure



(IV)

wherein
R represents the residue of said styrylically unsaturated alcohol,
M represents the residue of at least one said cyclic ether which is ring-opened, and,
m represents an integer in the range from 2 to about 500.

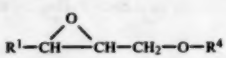
10. A polyether macromer having a styryl group near one end, a hydroxyl group at the other, and having a molecular weight distribution not exceeding 5.0 and being formed by polymerizing
(A) a cationically ring-openable cyclic ether selected from the group consisting of
(i) at least one alkylene oxide having the structure



(I)

wherein,
x is an integer in the range from 0 to about 4, except that when x>1, a second alkylene oxide having x=1 or 0 must be present, and,
R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, C_1–C_{20} alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, C_6–C_{20} aryl and aralkyl, and, at least one of R^1, R^2, and R^3 is hydrogen; and,

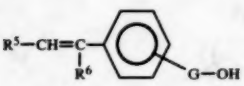
(ii) an aliphatic or aromatic glycidyl ether having the structure



(II)

wherein R^1 has the same connotation as hereinabove; and, R^4 represents a member selected from the group consisting of C_1–C_{20} alkyl or substituted alkyl, haloalkyl, alkenyl substituted alkenyl, haloalkenyl, alkoxyalkyl, aryl (Ar), substituted aryl (Ar—Q), wherein Q is selected from the group consisting of C_1–C_{10} alkyl, haloalkyl, C_2–C_{10} alkenyl or haloalkenyl; and,

(B) a monoolefinically ("styrylically") unsaturated primary or secondary alcohol represented by the structure



(III)

wherein,

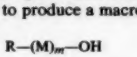
G, if present, is in an ortho-, meta-, or para- position of the phenyl ring which may be substituted, said position being relative to that of the olefinically unsaturated group, and is a spacer selected from the group consisting of branched or linear alkyl, aralkyl, haloalkyl, haloaralkyl, alkoxyl, haloalkoxyl, aralkoxyl and haloaralkoxyl, each having from 1 to about 20 carbon atoms (C_1–C_{20}); and,

R^5 and R^6 are selected from from the group consisting of hydrogen, C_1–C_{10} alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, at least one of R^5 and R^6 is always H;

in the presence of an effective amount of

(C) a cationic initiator selected from the group consisting of Friedel-Crafts acids, relatively strong protic organic and inorganic acids, oxonium salts and stable carbenium ions;

so as to produce a macromer having the structure



(IV)

wherein

R represents the residue of said styrylically unsaturated alcohol,

M represents the residue of at least one said cyclic ether which is ring-opened, and,

m represents an integer in the range from 2 to about 500;

whereby said macromer is procuced in conjunction with at least a trace quantity of cyclic oligomer of said cyclic ether.

4,680,359

MOLDING COMPOSITIONS FOR OPTICALLY READABLE INFORMATION-STORAGE MEDIA

Ralf Liebler, Darmstadt, and Klaus Albrecht, Mainz, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,366

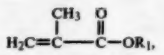
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337890

Int. Cl.[4] C08F *20/10*

U.S. Cl. 526—309 **12 Claims**

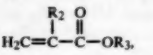
1. A copolymer, adaptable to use as a molding composition for making optically readable data storage media, said copolymer being free of aromatic groups and comprising

(A) from 20 to 70 percent by weight of at least one ester of the formula



wherein R_1 is derived from an alcohol, R_1OH, which is cyclohexanol, an alkyl-substituted cyclohexanol wherein each alkyl has up to 12 carbon atoms, a cyclohexylalkanol, or a bicyclic or tricyclic alcohol, with the proviso that a homopolymer of such an ester have a Vicat softening temperature (in conformity with DIN 53460) above 80° C.;

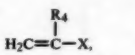
(B) from 10 to 60 percent by weight of at least one ester of the formula



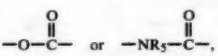
wherein R_2 is hydrogen or methyl and R_3 is a linear or branched aliphatic group having from 2 to 22 carbon atoms, with the proviso that a homopolymer of such an ester have a Vicat softening temperature (in conformity with DIN 53460) below 90° C.;

(C) from 20 to 40 percent by weight of methyl methacrylate; and

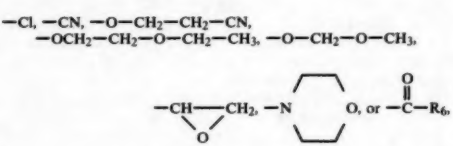
(D) from 0 to 20 percent of at least one aprotic monomer having a polar group X, of the formula



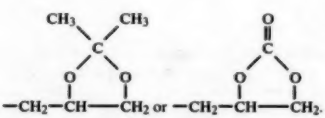
wherein R_4 is hydrogen or methyl and X is —CN or —Y—A—Z, wherein Y is



wherein R_5 is alkyl having from 1 to 6 atoms, A is a hydrocarbon chain having from 1 to 8 carbon atoms, and Z is



wherein R_6 is (C_1–C_3)-alkyl or phenyl, or wherein A—Z is



4,680,360

PROCESS FOR PRODUCING POLY(ALLYLAMINE) DERIVATIVES

Toshio Ueda, Koriyama; Yoshinori Sato, Fukushima, and Susumu Harada, Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd, Fukushima, Japan

Filed Nov. 13, 1984, Ser. No. 671,004

Claims priority, application Japan, Nov. 14, 1983, 58-213699; Nov. 18, 1983, 58-216359

Int. Cl.[4] C08F *4/04, 26/02*

U.S. Cl. 526—310 5 Claims

1. A process for producing a poly(allylamine) derivative, which comprises polymerizing an inorganic acid salt of monoallylamine with a radical-polymerization initiator having an azo group in the molecule, converting the resulting poly(allylamine salt) into poly(allylamine), and reacting the resulting poly(allylamine) with an acrylic compound having an electron attracting group adjacent to the double bond.

4,680,361

NOVEL POLYMERS AND CROSSLINKED COMPOSITIONS MADE THEREFROM

Joseph V. Koleske, Charleston, W. Va.; Donald F. Smith, Bridgewater, and Robert J. Weber, Neshanic, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 20, 1986, Ser. No. 831,199

Int. Cl.[4] C08F *20/64*

U.S. Cl. 526—318 25 Claims

1. A crosslinked composition comprising one or more prepolymers obtained by polymerizing, to a molecular weight of about 300 to about 150,000, one or more ethylenically unsaturated monomers with a composition comprising:

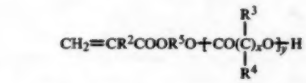
(a) 0 to 10 weight percent of a lactone;

(b) 0 to about 10 weight percent of hydroxyethyl acrylate or methacrylate;

(c) 0 to about 2 weight percent of one or more diacrylates;

(d) 0 to about 10 weight percent of products resulting from Michael addition, acrylate polymerization, transesterification reactions, or other side reactions;

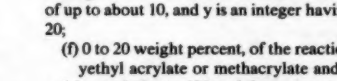
(e) 0 to about 50 weight percent of a reactive monomer of the following average formula:



wherein R^5 is a divalent radical, R^2 is either hydrogen or methyl, each of R_3 and R_4 is hydrogen, phenyl, or lower alkyl having 1 to about 6 carbon atoms, x is an integer having a value of up to about 10, and y is an integer having a value up to about 20;

(f) 0 to 20 weight percent, of the reaction product of hydroxyethyl acrylate or methacrylate and an anhydride; and

(g) remainder to 100 weight percent of a reactive monomer of the following average formula:



wherein R is H, methyl or ethyl, R′ is an alkylene radical having 2 to about 12 carbons, R″ is an alkylene radical having about 1 to about 10 carbons, R‴ is a divalent radical having 2 to about 20 carbons, m is an integer having a value of 1 to about 20, and z is an integer having a value of 1 to about 4;

and reacting said prepolymer or prepolymers with one or more crosslinking compounds capable of reacting with carboxyl and/or hydroxyl groups.

4,680,362

EMBEDDING MEDIA SUITABLE FOR THE PREPARATION OF THIN SECTIONS OF EMBEDDED BIOLOGICAL MATERIALS

Jean-Dominique Acetarin, Saint Louis, France; Werner Villiger, Basel, and Eric Carlemalm, Therwil, both of Switzerland, assignors to Chemische Werke Lowi GmbH, Waldkraiburg, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,563

Claims priority, application European Pat. Off., Mar. 22, 1985, 85103388.6

Int. Cl.[4] C08F *20/28*

U.S. Cl. 526—320 13 Claims

1. A method of producing an essentially non-polar embedding medium, which comprises the step of admixing ethyl methacrylate, n-butyl methacrylate, 1,3-butanediol diol dimethacrylate and a free radical polymerisation initiator at a ratio by weight of ethyl methacrylate:n-butyl methacrylate of 1.24 to 2.70:1, a ratio by weight of the combined ethyl methacrylate and n-butyl methacrylate:1,3-butanediol dimethacrylate of 11.14 to 16:1, and the polymerization initiator being included in the mixture in a small amount of from about 0.2% to about 1% by weight at above −70° C., and 0.50% to 1.25% at below −70° C., based on the total weight of the resulting embedding medium, the purity of each of the components being at least 90% by weight.

4,680,363

ONE COMPONENT SILICONE COMPOSITIONS WITH GOOD BONDING PROPERTIES

Melvin D. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 363,629, Mar. 30, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 571,138

Int. Cl.[4] C08G *77/06, 77/18*

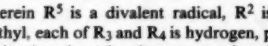
U.S. Cl. 528—14 2 Claims

1. A process for forming a one component RTV silicone rubber composition with good bonding properties at high humidity conditions, comprising:

(1) mixing

(A) 100 parts by weight of a silanol end-stopped diorganopolysiloxane polymer having a viscosity from 100 to 1,000,000 centipoise at 25° C. where the organo groups are monovalent hydrocarbon radicals;

(B) from 0.1 to 10 parts by weight of an acyloxy functional cross-linking agent of the formula



where R is a monovalent hydrocarbon radical of 1 to 8 carbon atoms, R^1 is an acyl radical of 2 to 30 carbon atoms, and m is 0 or 1;

(C) from 0.01 to 10 parts by weight of a curing promoter which is a salt of a carboxylic acid; and

(D) about 4 parts by weight of a magnesium or zinc salt of a carboxylic acid as an acid scavenger.

4,680,364

ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITIONS HAVING IMPROVED ADHESION

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 746,144, Jun. 18, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,522

Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—15 19 Claims

1. A curable composition comprising:

(a) a polydiorganosiloxane wherein the silicon atom at each polymer chain end is terminated with at least two hydrolyzable groups,

(b) an effective amount of non-chelate metal salt of a mono-

carboxylic acid, metal salt of a dicarboxylic acid, metal alkoxide or mixture thereof condensation catalyst, and

(c) an effective amount of metal chelate adhesion promoter.

4,680,365

METHOD FOR PREPARING ACETOXYSILOXANES AND ORGANO(POLY)SILOXANES HAVING HALOGEN BONDED TO SILICON

Johann Müller; Christa Trieschmann; Walter Doskocil, and Gerhard Preiner, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,296

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518605

Int. Cl.[4] C08G *77/06, 77/08;* **C07F** *7/04;* **C08F** *283/12*

U.S. Cl. 528—15 **14 Claims**

1. A method for preparing acetoxysiloxanes or organo(poly)siloxanes having halogen bonded directly to silicon, which comprises reacting an organopolysiloxane having hydrogen bonded directly to silicon, with an allyl compound in the presence of a catalyst selected from the group consisting of metallic palladium, ruthenium, rhodium, an acetylacetone complex of a metal selected from palladium, ruthenium or rhodium, a phosphine complex of a metal selected from palladium, ruthenium or rhodium, an acetylacetone composition containing a metal selected from the group consisting of palladium, ruthenium and rhodium and a phosphine composition containing palladium, ruthenium or rhodium, in which the allyl compound is selected from the group consisting of an allylhalide having 3 carbon atoms per molecule and an allyl acetate.

4,680,366

FABRIC-FINISHING AGENT CONTAINING A NOVEL ORGANOPOLYSILOXANE

Masaki Tanaka, and Shoji Ichinohe, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1986, Ser. No. 875,328

Claims priority, application Japan, Jun. 20, 1985, 60-134489

Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—27 **4 Claims**

1. An organopolysiloxane represented by the average unit formula

$$R^1_aF^2_bY_cZ_dSiO_{(4-a-b-c-d)/2},$$

in which R^1 is a monovalent hydrocarbon group having 1 to 20 carbon atoms, R^2 is a monovalent group selected from the class consisting of hydroxy group and alkoxy groups having 1 to 20 carbon atoms, Y is an amino-substituted monovalent hydrocarbon group represented by the general formula

$$-R^3-\left(NH-CH_2CH_2\right)_eNY-R^4,$$

R^3 being a divalent hydrocarbon group having 1 to 8 carbon atoms, R^4 being a hydrogen atom or a monovalent hydrocarbon group having 1 to 20 carbon atoms and e being zero or 1, Z is a substituted monovalent hydrocarbon group represented by the general formula

$$-R^3-\left(NH-CH_2CH_2\right)_eNR^4-CH_2-CHOH-CH_2O-\left(C_2H_4O\right)_p\left(C_3H_6O\right)_qR^5,$$

R^3 and R^4 each having the same meaning as defined above, R^5 being a hydrogen atom or a monovalent hydrocarbon group having 1 to 20 carbon atoms, e being zero or 1, p being a positive integer not exceeding 50 and q being zero or a positive integer not exceeding 50, a is a positive number not exceeding 3, b is zero or a positive number not exceeding 3 and c and d are each a positive number not exceeding 1 with the proviso that a+b+c+d is smaller than 4.

4,680,367

PROCESS FOR THE PRODUCTION OF UREA GROUP-CONTAINING POLYISOCYANATES

Richard Kopp, Cologne; Gerhard Grögler, Leverkusen; Heinrich Hess, Leverkusen, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,590

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438527

Int. Cl.[4] C08G *18/00, 18/08*

U.S. Cl. 528—44 **9 Claims**

1. A process for the productin of urea group-containing, finely divided solid polyisocyanates which comprises emulsifying or suspending a urea group-free organic polyisocyanate in an excess of water so that said organic polyisocyanate amounts to about 1 to 65% by weight of the reaction mixture, said water containing about 0.01 to 5% by weight, based on the aqueous phase, of a protective colloid, reacting the organic polyisocyanate with water to yield a urea group-containing polyisocyanate and separting and recovering said urea group-containing, finely divided solid polyisocyanates.

4,680,368

ULTRAVIOLET CURABLE INK COMPOSITION

Hideo Nakamoto; Fumito Aosai, both of Nagoya; Hiroshi Fukushima, Kasugai, and Eriko Suda, Nagoya, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Jun. 3, 1986, Ser. No. 870,084

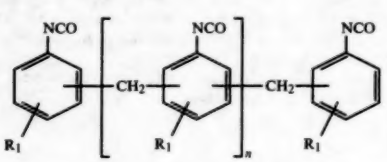
Claims priority, application Japan, Jun. 5, 1985, 60-122169

Int. Cl.[4] C08G *18/67*

U.S. Cl. 528—49 **8 Claims**

1. An ultraviolet curable ink composition comprising, as main components,

(A) a polyutethane poly(meth)acrylate obtained by reacting a polyisocyanate compound of the formula:



(I)

wherein R_1 is a hydrogen atom or a methyl group, and n is an integer of from 1 to 20, with a hydroxyl group-containing (meth)acrylate, and having, in one molecule, at least two (meth)acryloyl groups and at least two urethane bonds,

(B) a radical polymerizable low molecular weight compound, and

(C) a photopolymerization initiator.

4,680,369

SULFUR-CONTAINING POLYURETHANE BASE LENS RESIN

Nobuyuki Kajimoto; Akihiro Tamaki, and Teruyuki Nagata, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,222

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—76 **2 Claims**

1. A sulfur-containing polyurethane base lens resin obtained by reacting one or more isocyanate compounds, which have two or more NCO groups, with one or more OH-containing compounds selected from the group consisting of di(2-hydroxyethyl)sulfide, 1,2-bis(2-hydroxyethylmercapto)-ethane, bis(2-hydroxyethyl)disulfide and 1,4-dithian-2,5-diol, in such proportions that the ratio of NCO groups to OH groups ranges

from 0.5 to 1.5, at least one of said one or more OH-containing compounds containing one or more sulfur atoms in the molecule thereof, and the total content of sulfur atoms in all OH-containing compounds being 20 wt. % or higher.

4,680,370

BRANCHED POLYCARBONATE COMPOSITION FROM TRIS(HYDROXYARYL)PHOSPHORUS COMPOUND

Janet C. Williams, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

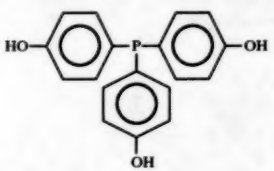
Filed Sep. 30, 1985, Ser. No. 781,162
Int. Cl.[4] C08G 63/62, 79/04
U.S. Cl. 528—167 **14 Claims**

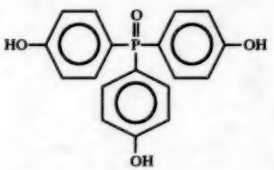
1. A composition of matter which comprises the polycarbonate reaction product produced under polycarbonate forming conditions by the reaction of

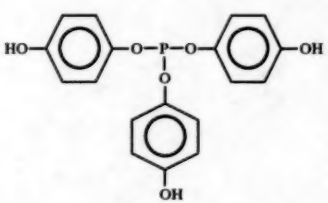
(1) a carbonyl halide,

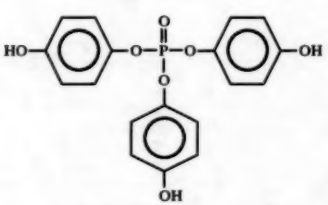
(2) a dihydric phenol, and

(3) an aromatic trihydroxy phosphorus compound selected from the following formulae:



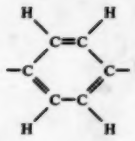






wherein the aromatic ring,

is



or the hydrogen substituted with a C_1 to C_4 alkyl, Cl, Br or a mixture thereof and wherein said phosphorus compound is present in amounts ranging within 0.05 mol% to about 0.5 mol% relative to said dihydric phenol to obtain random branching in said polycarbonate reaction product.

4,680,371

PREPARATION OF AROMATIC POLYESTER WITH IMPROVED STABILITY BY ADDITION OF PHOSPHITE DURING PREPARATION

(1) **Jerold C. Rosenfeld, Tonawanda, and Joseph A. Pawlak, Cheektowaga, both of N.Y., assignors to Celanese Corporation, New York, N.Y.**

Filed Feb. 25, 1986, Ser. No. 833,870
Int. Cl.[4] C08G 63/22
U.S. Cl. 528—179 **14 Claims**

1. A process for the preparation of an aromatic polyester comprising; melting a reaction mixture of diaryl terephthalate and/or diaryl isophthalate and bisphenol-A; and polymerizing said mixture in a first stage to prepare a polyester oligomer and

(2) continuing said reaction in a second stage to produce the polyester product; subsequent to melting said reaction mixture and prior to completion of polymerization in said first stage adding a phosphite stabilizer to said molten mixture.

4,680,372

IN-SITU END-CAPPING MELT PREPARED AROMATIC POLYESTER WITH PHENYL BENZOATE

(3) **Jerold C. Rosenfeld, Tonawanda, N.Y., assignor to Celanese Corporation, New York, N.Y.**

Filed Feb. 25, 1986, Ser. No. 833,650
Int. Cl.[4] C08G 63/12
U.S. Cl. 528—179 **12 Claims**

1. A process for end-capping a melt prepared aromatic polyester comprising melting a mixture of a dicarboxylic acid or diester thereof, a bisphenol and phenyl benzoate and reacting said mixture at elevated temperatures to produce a linear aromatic polyester which contains terminal groups of said dicarboxylic acid or ester thereof, wherein said terminal groups

(4) comprise benzoate groups.

4,680,373

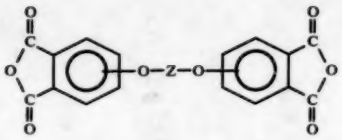
PROCESS FOR THE PRODUCTION OF A RANDOM COPOLYMER CONTAINING REPEATING POLYIMIDE UNITS AND REPEATING POLYETHERIMIDE UNITS

Patrick E. Gallagher, Pittsfield, and Ronald A. Greenberg, Lenox, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 687,867, Dec. 31, 1984, abandoned. This application May 27, 1986, Ser. No. 867,635
Int. Cl.[4] C08G 73/10
U.S. Cl. 528—185 **6 Claims**

1. A process for the production of a substantially random copolymer containing repeating polyimide units and repeating polyetherimide units comprising:

(a) reacting in a first reactor at least one dianhydride of the formula



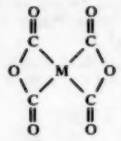
I

with a diamine of the formula

$$H_2N-R-NH_2 \qquad II$$

under imidization conditions for a time sufficient to produce amine-terminated oligomers;

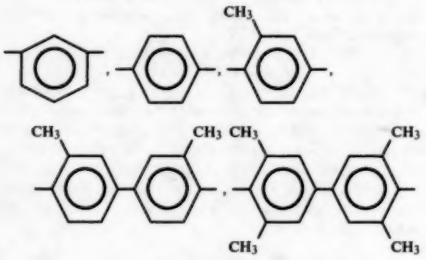
(b) heating in a second reactor at least one dianhydride of the formula

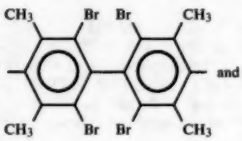


III

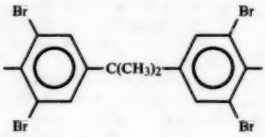
and an inert solvent to a temperature equal to or greater than the first reactor; and

(c) metering the contents of the first reactor into the contents of the second reactor at a rate of addition such that water can be removed from the reaction mixture as it is formed and heating the resulting mixture for a time sufficient to complete the imidization reaction, wherein the molar ratio of total dianhydride reacted to total diamine reacted is 1:0.5 to 1:2 and from about 78 to 99 mole percent of the total dianhydride is reacted in step (a) and wherein —O—Z—O— is in the 3 or 3'- and 4 or 4'-positions and Z is a member of the class consisting of (1)

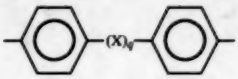




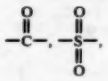
and



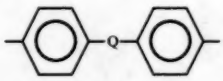
and (2) divalent organic radicals of the general formula:



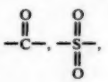
where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,



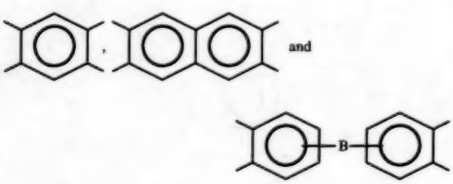
—O— and —S— where q is 0 or 1, y is a whole number from 1 to 5, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2 to about 20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of —O—,



—S—, and $-C_xH_{2x}-$, and x is a whole number from 1 to 5 inclusive, and M is a tetravalent radical selected from the class consisting of



and

where B is an electron-withdrawing group.

4,680,374

OPTICAL DISC SUBSTRATE MADE OF A COPOLYCARBONATE

Masayoshi Hasuo, Yokohama; Seiichi Mukai, Kunitachi; Hiroshi Urabe; Seiji Yoshida, both of Kawasaki, and Masahiro Nukui, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

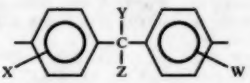
Filed Aug. 15, 1985, Ser. No. 765,802

Claims priority, application Japan, Aug. 24, 1984, 59-175078

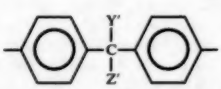
Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—204 **6 Claims**

1. A transparent optical disc substrate having a double refraction of not greater than 5×10^{-5} prepared from a polycarbonate containing at least 5 wt.%, based on the total carbonate bond-constituting units of the polycarbonate, of (I) carbonate bond-constituting units of the formula:



wherein each of Y and Z is hydrogen, or an aliphatic hydrocarbon group having from 1 to 6 carbon atoms, and each of X and W is an aliphatic hydrocarbon group having from 1 to 6 carbon atoms, and (II) carbonate bond-constituting units of the formula:



wherein each of Y' and Z' is hydrogen or a hydrocarbon group having from 1 to 10 carbon atoms in an amount which effectively aids in minimizing the optical distortion of the substrate.

4,680,375

POLYMERIC CYANINE DYE

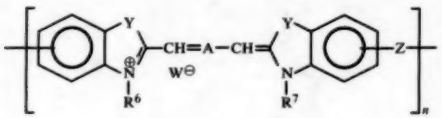
Mohamed A. Elmasry, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1985, Ser. No. 710,077

Int. Cl.[4] C08G *12/26, 73/06*

U.S. Cl. 528—253 **13 Claims**

1. A polymeric tricarbocyanine dye with a rigidized chain having tricarbocyanine polymeric dye units of formula I:

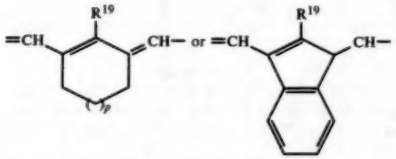


wherein

Y is

—S—, —Se— or —O—,

A is



in which R^{19} is alkyl, —Cl, amino, alkyl (C_1 to C_4) substituted amino, phenyl or cyclized amine, and

p is 0 or 1,

R^6 and R^7 independently are alkyl of (C_1–C_{30}),

Z is $—SO_2—$, $-(CH_2)_m-$, or vinylene, wherein m is an integer of 1 to 20,

W is a dye anion, and

n is an integer 2 to 10,000.

4,680,376

PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH-MOLECULAR POLYBUTYLENETEREPHTHALATE

Helmut Heinze, Frankfurt, and Fritz Wilhelm, Karben, both of Fed. Rep. of Germany, assignors to Davy McKee A.G., Fed. Rep. of Germany

Filed Jun. 5, 1986, Ser. No. 871,000

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544551

Int. Cl.[4] C08G *63/04, 63/34*

U.S. Cl. 528—279 **7 Claims**

1. In a process for the continuous production of high molecular weight polybutyleneterephthalate by esterification of terephthalic acid with 1,4-butanediol in the presence of organo-tin and/or organo-titanium compounds and the subsequent polycondensation of the esterification product obtained, the improvement comprising:

(a) continuously feeding a terephthalic acid/1,4 butanediol paste containing said catalyst into the first esterfication reactor as the beginning process stage;

(b) carrying out the esterfication during the first stage at temperatures of 225° to 260° C. and at absolute pressures of 0.1 up to a maximum of 1 bar;

(c) precondensing the esterification product from the first stage during a second stage at temperatures of 230° to 260° C. and at pressures of 10 to 200 mbar;

(d) continuously polycondensing said precondensate at temperatures of 240° to 265° C. and at pressures of 0.25 to 25 mbar;

(e) condensing 1,4-butanediol distilled off from said first and following process stages;

(f) removing water and tetrahydrofurane from said condensed 1,4-butanediol; and

(g) recycling said 1,4-butanediol to said first esterification reactor, at a total molar ratio of fresh and recycled 1,4-butanediol to terephthalic acid from 2 to 3.8.

4,680,377

POLYIMIDE PREPOLYMER COMPOSITION FROM UNSATURATED BISIMIDE AND DIAMINE CONTAINING UNREACTED REACTANTS

Masahiro Matsumura; Kenzi Ogasawara; Atsuhiro Nakamoto, and Yoshihisa Sugawa, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 5, 1985, Ser. No. 805,989

Claims priority, application Japan, Jan. 15, 1985, 60-4600

Int. Cl.[4] C08G *73/10, 73/12*

U.S. Cl. 528—322 **3 Claims**

1. A polyimide prepolymer composition of addition reaction obtained by reacting an unsaturated bisimide with a diamine; said composition consisting essentially of 41–55% of unreacted reactants, 39–54% of components having a molecular weight of between 400 and 15,000, and 3.0–6.8% of components having a molecular weight of more than 15,000 and wherein the molecular weight is measured by Gel Permeation Chromatography Analysis.

4,680,378

CYANATE FUNCTIONAL MALEIMIDE AND POLYAMINE COPOLYMER

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

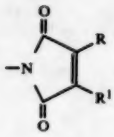
Filed Oct. 1, 1985, Ser. No. 782,643

Int. Cl.[4] C08G *83/00, 73/12*

U.S. Cl. 528—322 **4 Claims**

1. A polymerizable or curable composition which comprises

(A) at least one thermosettable compound which simultaneously contains in the same molecule only one maleimide group or substituted maleimide group which group is represented by the formula



wherein each R and R^1 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; and only one cyanate group; and

(B) at least one material containing a plurality of aromatic amine groups; and

components (A) and (B) are present in a quantity which provides a mole ratio of amine to total maleimide, substituted maleimide and cyanate groups of from about 0.001 to about 1:1.

4,680,379

HOMOGENEOUS COPOLYAMIDE COMPRISED OF HEXAMETHYLENEDIAMINE/ADIPIC ACID/SHORT CHAIN DIACID/DIMER ACID AND CATALYTIC PREPARATION THEREOF

Jean Coquard, Craponne, and Jean Goletto, Ecully, both of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Feb. 7, 1986, Ser. No. 826,926
Claims priority, application France, Feb. 7, 1985, 85 01912
Int. Cl.[4] C08G *69/34, 69/04*
U.S. Cl. 528—336 **21 Claims**

1. A process for the preparation of a homogeneous, high melting, flexible copolyamide, comprising (a) prepolymerizing either (i) mixture of adipic acid and hexamethylenediamine, or admixture thereof with at least one other short-chain dicarboxylic acid, or (ii) mixture of (1) a salt of adipic acid, or salt of admixture of adipic acid with at least one other short-chain dicarboxylic acid, and hexamethylenediamine, together with (2) free hexamethylenediamine, said prepolymerization (a) being carried out in the presence of a catalytically effective amount of a strong inorganic oxyacid, or strong organic oxyacid other than a carboxylic acid, or alkali or alkaline earth metal salt thereof, said resulting prepolymer having amino end groups, and thence (b) polycondensing said prepolymer with a fatty acid dimer.

4,680,380

ODOR-FREE CHLOROSULFONATED POLYOLEFINS

George M. Benedikt, Lakewood, and Dennis A. Barnes, Brunswick, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 19, 1983, Ser. No. 459,066
Int. Cl.[4] C08K *3/32, 3/26, 3/22*
U.S. Cl. 528—485 **16 Claims**

1. A method for eliminating the sulfur dioxide odor of vapor phase chlorosulfonated polyolefins comprising mixing with vapor phase chlorosulfonated polyolefins containing less than 300 ppm of free sulfur dioxide, less than 2 weight parts per 100 weight parts of polyolefin, of stabilizing amounts of inorganic additives selected from the group consisting of aluminum hydroxide, barium carbonate, barium hydroxide, magnesium hydroxide, magnesium oxide, potassium phosphate, sodium carbonate, disodium hydrogen phosphate and trisodium phosphate.

4,680,381

PROCESS FOR ISOLATING POLYMER

Masahiro Asada, and Miyuki Azuma, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 697,692, Feb. 4, 1985, abandoned, which is a continuation of Ser. No. 435,245, Oct. 19, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,100
Claims priority, application Japan, Oct. 20, 1981, 56-168039
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—501 **17 Claims**

1. A process for isolating a polymer which consists essentially of the steps of admixing a 1 to 80% by weight solution of a first polymer in an organic solvent which is substantially immiscible with water, with 50 to 10,000 parts of a 0.001 to 1% by weight aqueous solution of a water-soluble polymeric dispersant, and while agitating distilling away said organic solvent from the mixture in the form of a suspension, thereby depositing particles of said first polymer, said parts being parts by weight per 100 parts of the organic solvent solution.

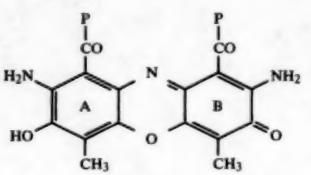
4,680,382

ANALOGUES OF ACTINOMYCIN D

Sisir K. Sengupta, Needham, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Feb. 3, 1986, Ser. No. 825,290
Int. Cl.[4] C07K *5/12*
U.S. Cl. 530—317 **2 Claims**

1. The compound having the formula:



wherein P = Thr—D-Val—Pro—Sar—MeVal

4,680,383

MONOCLONAL ANTIBODY TO HUMAN T CELLS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical, Raritan, N.J.

Division of Ser. No. 432,453, Oct. 4, 1982, Pat. No. 4,515,894, which is a division of Ser. No. 22,132, Mar. 20, 1979, Pat. No. 4,363,799. This application Aug. 10, 1984, Ser. No. 639,563
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.
Int. Cl.[4] C07K *15/00;* **A61K** *39/395*
U.S. Cl. 530—387 **4 Claims**

1. Mouse monoclonal antibody which reacts with essentially all normal human peripheral T cells.

4,680,384
DYES, THEIR PREPARATION AND USE

Karl Seitz, Oberwil; Henri Riat, Arlesheim, and Karl Hoegerle, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

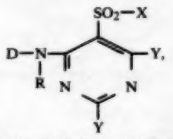
Continuation of Ser. No. 513,121, Jul. 13, 1983, abandoned, which is a continuation of Ser. No. 339,193, Jan. 13, 1982, abandoned, which is a division of Ser. No. 112,979, Jan. 17, 1980, Pat. No. 4,325,869, which is a continuation of Ser. No. 903,632, May 8, 1978, abandoned. This application Jul. 19, 1984, Ser. No. 632,558

Claims priority, application Luxembourg, May 9, 1977, 77286

Int. Cl.[4] C09B *45/00*

U.S. Cl. 534—622 16 Claims

1. A dye of the formula



(1)

in which D is the radical of a monoazo, polyazo or metal complex azo dye, R is hydrogen or a low molecular weight alkyl group which may be substituted by halogen or hydroxyl, X is alkyl or alkenyl which may be substituted by halogen, alkoxy or aryl, one Y is a halogen atom and the other Y is halogen, alkyl which may be substituted by halogen, alkenyl which may be substituted by halogen or is a nitro, cyano, carboxyl, carboxylic acid ester, carboxamide, sulfonamide, sulfo or sulfonic acid ester group, amino, hydroxylamino, hydrazino, phenylhydramino, sulfophenylhydrazino, alkylamino or dialkylamino which may be substituted in the alkyl moiety by hydroxy, alkoxy, chloro, phenyl, sulfato or sulfo, cyclohexylamino, N-alkyl-N-phenylamino, N-sulfomethyl-N-phenylamino, phenylamino which may be substituted by alkyl, alkoxy, chloro, amino, hydroxy, nitro, carboxy, acetylamino, ureido, sulfomethyl or sulfo, napthylamino which may be substituted by amino, hydroxy or sulfo, pyridylamino, benzthiezolylamino, quinolylamino, pyrimidylamino, morpholine, piperidino, piperazino, hydroxy, alkoxy which may be substituted by alkoxy, alkoxyalkoxy or carboxy, phenoxy which may be substituted by chloro, nitro, carboxy or sulfo, naphthoxy which may be substituted by sulfo, mercapto, alkylthio which may be substituted by cathoxy, or is thiouraide, phenylthio which may be substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-6}-acylamino, amino, alkylamino, dialkylamino, the ureido, hydroxyl, sulfo or carboyxl group, or halogen, or is naphthylthio which may be substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-6}-acylamino, amino, alkylamino, dialkylamino, the ureido, hydroxyl, sulfo or carboxyl group or halogen.

4,680,385
METAL DYE COMPLEXES CONTAINING AN AZO OR AZOMETHINE DYE AND A COLORLESS LIGAND WITH THE C=N—N=C GROUP

Gerhard Back, Lörrach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

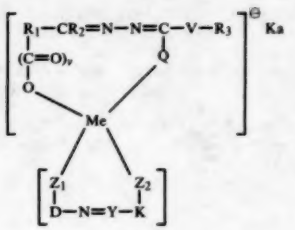
Filed Mar. 28, 1985, Ser. No. 717,733

Claims priority, application Switzerland, Apr. 6, 1984, 1751/84

Int. Cl.[4] C09B *45/06, 45/16;* D06P *1/10, 3/24*

U.S. Cl. 534—695 10 Claims

1. A chromium or cobalt complex of the formula



wherein:

D is the radical of a benzene, napthalene or heterocyclic diazo component;

Y is nitrogen or —CH;

K is the radical of a coupling component if Y is nitrogen, or an o-hydroxyaldehyde radical if Y is —CH:

Ka is a cation;

Me is chromium or cobalt;

Z_1 is —O— or —COO— ortho to N=Y

Z_2 is —O— or —NR vicinal to N=Y, wherein R is hydrogen, or a C_1–C_4alkyl or phenyl radical;

R_1 is a direct bond or a C_1–C_8-alkyl, C_1–C_8-alkenyl, or aryl radical or heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;

R_2 is hydrogen or a C_1–C_8-alkyl or aryl radical;

R_3 is hydrogen or a C_1–C_8alkyl, aryl or amino radical, or a heterocyclic radical containing to 1 to 3 sulfur, oxygen or nitrogen atoms;

V is a direct bond or oxygen;

Q is oxygen or sulfur; and

w is 0 or 1.

4,680,386
6-O-METHYLERYTHROMYCIN A DERIVATIVE

Shigeo Morimoto; Takashi Adachi, both of Saitama; Toshifumi Asaka, Ageo; Yoshiaki Watanabe, Kodaira, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

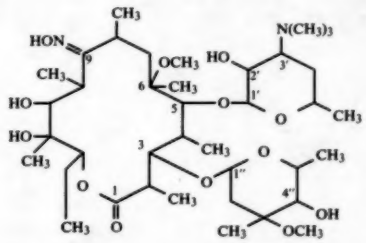
Filed Oct. 21, 1985, Ser. No. 789,771

Claims priority, application Japan, Oct. 26, 1984, 59-225543

Int. Cl.[4] A61K *71/31*

U.S. Cl. 536—7.4 2 Claims

1. A 6-O-methylerythromycin A derivative represented by the formula



and the salts thereof.

4,680,387

PREPARATION OF POLYHALO-COPPER PHTHALOCYANINES HAVING A HIGH COLOR STRENGTH

Joachim Kranz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,391

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442118

Int. Cl.[4] C09B 47/04, 47/08

U.S. Cl. 540—136 4 Claims

1. In a process for preparing a polyhalocopper phthalocyanine having high color strength by recrystalliation of a finely divided, agglomerated crude polyhalcopper phthalocyanine in an organic aqueous phase at elevated temperatures, the improvement comprising heating said crude polyhalocopper phthalocyanine to 80°–130° C. with benzoic acid, toluic acid, ethylbenzoic acid, or a mixture thereof, and maintaining said elevated temperature until the desired pigmentary form has formed.

4,680,388

O-SULFATED SPIRO β-LACTAM HYDROXAMIC ACIDS

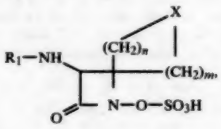
Joseph E. Sundeen, Yardley, Pa.; William H. Koster, East Amwell Township; Hunterdon County, and Robert Zahler, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 728,432, Apr. 29, 1985, Pat. No. 4,638,060. This application Jul. 31, 1986, Ser. No. 891,494

Int. Cl.[4] C07D 487/10, 491/107, 495/10, 471/10

U.S. Cl. 540—203 6 Claims

1. A compound having the formula



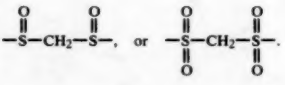
or a pharmaceutically acceptable salt thereof,

wherein

R_1 is acyl; and

n and m are each independently 1, 2, 3 or 4, the sum of n+m≦5 and X is —O—, —S—, or

or n and m are each 1 and X is —S—CH_2—S—,



4,680,389

TEMPERATURE STABLE CRYSTALLINE DI(1-METHYL-2-PYRRALIDINONE) AND DI(N-FORMYLPYRROLIDINE) ADDUCTS OF CEPHALOSPORIN DERIVATIVES

Murray A. Kaplan, Syracuse; Joseph B. Bogardus, and Robert A. Lipper, both of Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,646

Int. Cl.[4] C07D 501/46

U.S. Cl. 540—222 4 Claims

1. High temperature stable crystalline adducts of 7-[(Z)-2-methoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-[(1-methyl-1-pyrrolidinium)methyl]-3-cephem-4-carboxylate selected from the group consisting of the di(1-methyl-2-pyrrolidinone) adduct, di(N-formyl-pyrrolidine) adduct, and 1-methyl-2-pyrrolidinone adduct-NaCl complex.

4. A method for preparing a 7-[(Z)-2-methoxyimino-2-(2-aminothizol-4-yl)acetamido]-3-[(1-methyl-1-pyrrolidinium)methyl]-3-cephem-4-carboxylate (1-methyl-2-pyrrolidinone) adduct-NaCl complex comprising:

(a) admixing 10–100 mg/ml of lyphilized zwitterion-NaCl complex in 1-methyl-2-pyrrolidinone,

(b) inducing crystallization with seed crystals of a 1-methyl-2-pyrrolidinone adduct-NaCl, and

(c) isolating the (1-methyl-2-pyrrolidinone) adduct-NaCl complex.

4,680,390

ESTERS OF 7-[2-(2-AMINOTHIAZOL-4-YL)-2-(SYN)-METHOXYIMINOACETAMIDO]-3-METHYL-CEPH-3-EM-4-CARBOXYLIC ACID

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

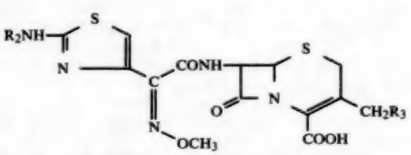
Division of Ser. No. 922,423, Jul. 6, 1978, Pat. No. 4,520,194, which is a division of Ser. No. 787,258, Apr. 13, 1977, abandoned, which is a division of Ser. No. 428,032, Sep. 29, 1982, Pat. No. 4,278,671. This application Oct. 4, 1984, Ser. No. 657,778

Claims priority, application Japan, Apr. 14, 1976, 51-42885; Sep. 8, 1976, 51-108102

Int. Cl.[4] C07D 501/22

U.S. Cl. 540—228 3 Claims

1. An ester selected from the group consisting of lower alkoxymethyl, 1-lower alkoxyethyl, lower alkylthiomethyl, pivaloyloxymethyl, acetoxymethyl, 1-acetoxyethyl and 1-ethoxycarbonyloxyethyl esters of a 7-[2-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]cephalosporin derivative of the formula:



wherein R_3 is hydrogen and R_2NH is an amino group which may optionally be protected.

4,680,391
SUBSTITUTED AZETIDINONES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

Raymond A. Firestone, Fanwood, and Peter L. Barker, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 557,030, Dec. 1, 1983, abandoned. This application Apr. 10, 1985, Ser. No. 721,811

Int. Cl.[4] C07D *205/08, 401/04, 403/04;* A61K *31/395*

U.S. Cl. 540—355 11 Claims

1. A compound of formula

(I)

wherein:

R is hydrogen or C_{1-3}alkyl:

R^1 is

(1) hydrogen;

(2) C_{1-6}alkyl;

(3) C_{1-6}alkoxy;

(4) C_{1-6}alkenyl; or

(5) phenyl or phenyl substituted with one or more radicals selected from the group consisting of loweralkyl, hydroxy, alkoxy, halo, nitro, loweralkylthio, arylthio, mercapto, amino, cyano, carboxy, aminosulfonyl, aminosulfenyl, aminosulfinyl, carbamoyl, carbamoyloxy, loweralkyl or aryl sulfonyl, loweralkyl or aryl sulfinyl, SO_3R^5, azido, or carboxamido;

R^2 is hydrogen;

R^3 is

(1) SR^5 wherein R^5 represents C_{1-6}alkyl, phenyl or substituted phenyl as previously defined;

(2) SOR^5;

(3) C_{1-6}alkanoyloxy;

(4) COOB or $CONBB_1$ wherein B and B_1 independently represent

(a) H;

(b) straight or branched alkyl having from 1 to 20 carbon atoms;

(c) aryl having from 6 to 10 carbon atoms;

(d) cycloalkyl having from 3 to 8 carbon atoms;

(e) straight or branched alkenyl having from 2 to 20 carbon atoms;

(f) straight or branched alkynyl having from 2 to 20 carbon atoms;

(g) aralkyl, alkaryl, aralkenyl, aralkenyl, alkenylaryl or alkenylaryl wherein alkyl, aryl, alkenyl and alkynyl are as previously defined; the above groups (a)-(g) can be unsubstituted or can be substituted by one or more selected radicals from the group consisting of loweralkyl, hydroxy, alkoxy, halo, nitro, loweralkylthio, arylthio, mercapto, cyano, carboxy, aminosulfonyl, aminosulfenyl, aminosulfinyl, carbamoyl, carbamyloxy, loweralkyl or aryl sulfonyl, loweralkyl or aryl sulfinyl, SO_3R^5, azido, amino, or carboxamido;

(5) phenyl or substituted phenyl as previously defined; and

A is

(1) SO_2R^5; or

(2) $SO_3^-M^+$ wherein M^+ represents (a) an alkali anion selected from a group consisting of Na^+ and K^+; or (b) a quaternary ammonium group of formula $N^+(R^5)_4$.

4,680,392
SUBSTITUTED CAPROLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

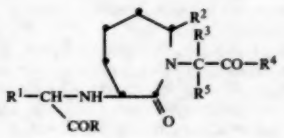
Elbert E. Harris; Arthur A. Patchett, both of Westfield, and Eugene D. Thorsett, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 394,749, Jul. 2, 1982, Pat. No. 4,629,787, which is a continuation-in-part of Ser. No. 282,580, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 179,305, Aug. 18, 1980, abandoned. This application May 19, 1986, Ser. No. 864,234

Int. Cl.[4] C07D *223/10, 223/12*

U.S. Cl. 540—527 28 Claims

1. A compound of the formula:



wherein

R and R^4 are the same or different and are hydroxy, C_1–C_8alkoxy, C_2–C_{12}alkenoxy, C_6–C_{12}aryloxy, di-C_1–C_8-alkylamino-C_1–C_8-alkoxy, acylamino-C_1–C_8-alkoxy selected from the group: acetylaminoethoxy, nicotinoylaminoethoxy, and succinamidoethoxy; pivaloyloxyethoxy, C_6–C_{12}aryl-C_1–C_8alkoxy, hydroxy-C_1–C_8alkoxy dihydroxy-C_1–C_8alkoxy amino, hydroxyamino;

R^1 is hydrogen, C_1–C_{12}alkyl which include branched and unsaturated alkyl groups, substituted C_1–C_8alkyl wherein the substituent(s) can be halo, C_1–C_8alkoxy, C_6–C_{12}aryloxy, amino, C_1–C_8alkylamino, hydroxy, di-C_1–C_8alkylamino, amino-C_1–C_8alkylthio, amino-C_1–C_8alkoxy, acetamido, benzamido, C_6–C_{12}arylamino, guanidino, phthalimido, mercapto, C_1–C_8alkylthio, C_6–C_{12}arylthio, carboxy, carboxamido or carbo-C_1–C_8alkoxy, C_6–C_{12}aryl-C_1–C_8alkyl, C_6–C_{12}aryl-C_2–C_8alkenyl; substituted C_6–C_{12}alkyl-C_1–C_8alkyl wherein the alkyl portion may be substituted by amino, hydroxy acetamido or benzamido,

R^2 is hydrogen, C_1–C_8alkyl, unsubstituted C_3–C_{10}cycloalkyl, amino-C_1–C_8alkyl, C_1–C_{12}alkylamino-C_1–C_8alkyl, hydroxy-C_1–C_{12}alkyl, acetamido- or benzamido-C_1–C_8alkyl, di-C_1–C_{12}alkylamino-C_1–C_8alkyl including polyethyleneamino-C_3–C_{10}cycloalkyl, C_6–C_{12}aryl-C_1–C_8alkyl, C_6–C_{12}aryl, substituted C_6–C_{12}aryl wherein the substituent is halo, C_1–C_{12}alkyl, amino-C_1–C_{12}alkyl, or C_1–C_{12}alkoxy;

R^3 is hydrogen, C_1–C_8alkyl, phenyl, phenyl C_1–C_8alkyl, hydroxyphenyl-C_1–C_8alkyl, hydroxy-C_1–C_8alkyl, amino-C_1–C_8alkyl, acetamido- or benzamido-C_1–C_8alkyl, guanidino-C_1–C_8alkyl, imidazolyl-C_1–C_8alkyl, indolyl-C_1–C_8alkyl, mercapto-C_1–C_8alkyl or C_1–C_8alkyl thio-C_1–C_8alkyl;

R^5 is hydrogen or C_1–C_8alkyl;

and, the pharmaceutically acceptable salts thereof.

4,680,393
PROCESS FOR THE SELECTIVE SYNTHESIS OF TERTIARY ALKANOLAMINES

John A. Marsella, Allentown, Pa., assignor to Air Products and Chamicals, Inc., Allentown, Pa.

Filed May 8, 1986, Ser. No. 861,029

Int. Cl.[4] C07C *85/06, 91/06;* C07D *295/08*

U.S. Cl. 544—170 23 Claims

1. In a process for the preparation of a tertiary alkanolamine by reacting a secondary amine with an alkanediol at a temperature between 150°-200° C., the method for improving the selectivity for mono-aminated product which comprises: carrying out said reaction in the presence of a compound or com-

plex of ruthenium in chemical combination or in admixture with an organic phosphine ligand, said ligand being present in an amount such that the ratio of gram mole ligand/gram atom ruthenium is greater than 5.

4,680,394

METHOD OF PREPARING FORMALDOXIME TRIMER

John H. Bonfield, Basking Ridge, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 23, 1985, Ser. No. 778,935
Int. Cl.[4] C07D *251/06*
U.S. Cl. 544—193 **7 Claims**

1. A process for the manufacture of formaldoxime trimer which comprises:

(a) reacting formaldehyde, as paraformaldehyde to the substantial exclusion of aqueous formaldehyde, with a slight stoichiometric excess dihydroxylamine sulfate;

(b) treating the reaction product of step (a) by adding ammonia at least stoichiometrically equivalent to the paraformaldehyde and substoichiometric relative to the dihydroxylamine sulfate;

(c) steam stripping the reaction product of step (b) to recover the formaldoxime as a vapor; and

(d) squelch condensing the emergent vapor from step (c) on a continuously flush wetted condensing surface; and

(e) generating the formaldoxime trimer by cooling the condensate of step (d) to 0°–5° C.

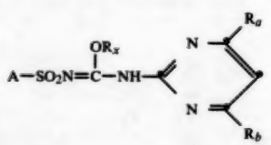
4,680,395

SULFONYLISOUREAS

Haukur Kristinsson, Bottmingen, and Werner Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 542,312, Oct. 14, 1983, Pat. No. 4,521,597. This application Mar. 1, 1985, Ser. No. 707,325
Claims priority, application Switzerland, Oct. 25, 1982, 6202/82
Int. Cl.[4] C07D *239/69*
U.S. Cl. 544—321 **2 Claims**

1. A pyrimidyl-sulfonyl isourea of the formula



in which

R_a is the difluoromethoxy group,

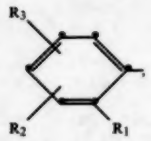
R_b is halogen, C_1–C_5-alkyl, C_1–C_5-haloalkyl, C_1–C_5-alkoxy, C_1–C_5-haloalkoxy, C_1–C_5-alkylthio, C_2–C_{10}-alkoxyalkyl or C_2–C_{10}-alkoxyalkoxy or is an amino group

wherein

R_c is hydrogen, methyl or ethyl, and

R_d is hydrogen, methyl, ethyl or methoxy,

A is a radical of the formula



R_1 is halogen, nitro, trifluoromethyl, C_1–C_5-alkyl, C_1–C_5-alkoxy, $—COR_7$, $—S(O)_m—C_1$–C_5-alkyl, $—SO_2R_{10}$, XR_{11} or $—OSO_2C_1$–C_5-alkyl,

R_2 is hydrogen,

R_3 is hydrogen,

R_7 is hydrogen, C_1–C_5-alkyl, C_1–C_5-haloalkyl, C_1–C_5-alkoxy, C_1–C_5-haloalkoxy, C_2–C_{10}-alkoxyalkoxy, C_3–C_5-alkenyloxy, C_3–C_5-alkynyloxy, phenoxy, benzyloxy, C_1–C_5-alkylthio or $—NR_8R_9$,

R_8 is hydrogen, C_1–C_5-alkyl, cyanoalkyl having a maximum of 5 carbon atoms, methoxy, ethoxy or C_3–C_5-alkenyl,

R_9 is hydrogen, C_1–C_5-alkyl or C_3–C_5-alkenyl, or

R_8 and R_9 together with the nitrogen atom binding them form a 5- or 6-membered, saturated heterocycle which can contain an oxygen or sulfur atom as ring member,

R_{10} is C_1–C_5-haloalkoxy or $—NR_8R_9$,

R_{11} is C_1–C_5-alkyl which is substituted by halogen or C_1–C_5-alkoxy, or C_2–C_5-alkenyl which is unsubstituted or substituted by halogen or C_1–C_5-alkoxy,

R_x is C_1–C_5-alkyl,

X is oxygen or $—S(O)_m—$ and

m is zero, one or two.

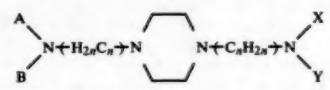
4,680,396

BIS(AMINOALKYL)PIPERAZINE DERIVATIVES AND THEIR USE AS METAL ION CONTROL AGENTS

Druce K. Crump, Lake Jackson; Jaime Simon, Angleton, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1984, Ser. No. 583,526
Int. Cl.[4] C07D *295/12*
U.S. Cl. 544—337 **21 Claims**

1. The compounds having the formula



wherein n is 2 or 3 and wherein substituents A, B, X and Y each are independently selected from the group consisting of hydrogen, hydroxyalkyl (wherein the alkyl group has 2–6 carbon atoms), methylenephosphonic, hydroxymethyl-, hydroxyethyl- and hydroxypropylsulfonic acid radicals, carboxylic acid radicals (having 2–4 carbon atoms) and the alkali, alkaline earth metal, ammonium and amine salts of any of the phosphonic, sulfonic or carboxylic acid compounds, and wherein at least one of A, B, X and Y is other than a hydrogen.

4,680,397

APOVINCAMINOL DERIVATIVE

Tibor Keve; Béla Zsadon; György Fekete, all of Budapest; János Galambos, Érd; Margit Barta née Bukovecz, Budapest; László Szporny, Budapest; Lilla Forgács, Budapest; Árpád Király, Budapest; Gyöngyvér Soós, Budapest; Béla Kiss, Vecsés, and Mária Zájer née Balázs, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 25, 1985, Ser. No. 727,130

Claims priority, application Hungary, Apr. 25, 1984, 1582/84

Int. Cl.[4] C07D *461/00*

U.S. Cl. 546—51 1 Claim

1. 18β-Hydroxy-apovincaminol 3',4',5'-trimethoxybenzoate.

4,680,398

PYRAZOLO[1,5-A]PYRIDINES AND BENZIMIDAZOLES, USEFUL AS ANTIALLERGIC AGENTS

Tsutomu Irikura, Tokyo; Keigo Nishino, Oomiya; Kyuya Okamura, Oomiya, and Toshiya Ikeda, Oomiya, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

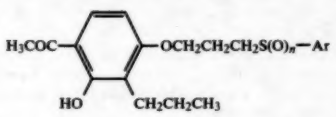
Filed Jan. 30, 1986, Ser. No. 824,099

Claims priority, application Japan, Feb. 14, 1985, 60-27267

Int. Cl.[4] C07D *471/04, 235/28*

U.S. Cl. 546—121 10 Claims

1. Compounds having general formula (I)



(I)

wherein Ar is a pyrazolo[1,5-a]pyridin-3-yl ring which may be substituted by a straight or branched alkyl group having 1 to 4 carbon atoms, or Ar is a benzimidazol-2-yl ring, and n is an integer of 0 to 2, or a pharmaceutically acceptable salt thereof.

4,680,399

PROCESS FOR THE ISOLATION AND PURIFICATION OF PODOPHYLLOTOXIN

Ole Buchardt, Vaerlose, Denmark, assignor to pHarma-medica a-s, Herley, Denmark

Filed Sep. 9, 1985, Ser. No. 773,929

Claims priority, application United Kingdom, Sep. 26, 1984, 8424269

Int. Cl.[4] C07D *405/14*

U.S. Cl. 546—139 11 Claims

1. In a process for obtaining purified podophyllotoxin from an impure podophyllotoxin containing starting material, the improvement comprising forming a solution of said starting material, forming a solid complex of podophyllotoxin and an aromatic or heteroaromatic compound other than benzene, and separating the solid complex from the solution.

4,680,400

HERBICIDAL CYCLOHEXANE-1,3-DIONE-5-ISOQUINOLINE DERIVATIVES

Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir, and Keith G. Watson, Box Hill North, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

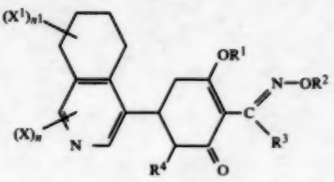
Division of Ser. No. 591,372, Mar. 20, 1984. This application Nov. 12, 1986, Ser. No. 929,473

Claims priority, application Australia, Apr. 7, 1983, PF8781; May 5, 1983, PF9189

Int. Cl.[4] C07D *471/04*

U.S. Cl. 546—141 3 Claims

1. A compound of formula



wherein:

X, which may be the same or different, are independently selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy and halogen;

X^1, which may be the same or different, are selected from hydroxy or two of X^1 on the same carbon may form an oxo group;

R^1 is selected from the group consisting of hydrogen and the alkali metals;

R^2 is selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 fluoroalkyl, allyl and propargyl;

R^3 is selected from the group consisting of C_1 to C_3 alkyl;

R^4 is hydrogen;

n is zero or an integer selected from 1 to 2; and

n^1 is zero or an integer selected from 1 to 2.

4,680,401

PREPARATION OF HALOGENATED QUINOLONECARBOXYLIC ACIDS

Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

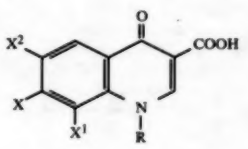
Filed Jul. 12, 1985, Ser. No. 754,563

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426483

Int. Cl.[4] C07D *215/16*

U.S. Cl. 546—153 3 Claims

1. In the preparation of a halogenated quinolonecarboxylic acid of the formula

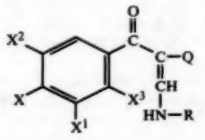


in which

R is alkyl with 1-3 carbon atoms, 2- fluoroethyl, phenyl, methoxy or cyclopropyl,

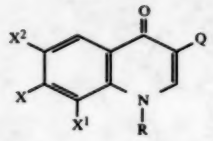
X is halogen, and

X^1 and X^2 each independently is hydrogen or halogen, wherein the compound



in which

X^3 is halogen, and R, X, X^1 and X^2 are as defined above, is condensed to form a cyclic product of the structure



and such cyclic product is hydrolyzed, the improvement wherein Q is —C≡N.

4,680,402

BENZOYL-PHENYL-PIPERIDINE DERIVATIVES

Bernard Majoie, Dijon; Francois Bellamy, Saulon-la-Rue; Pierre Dodey, and Jacques Robin, both of Dijon, all of France, assignors to Societe de Recherches Industrielles (S.O.R.I.), Paris, France

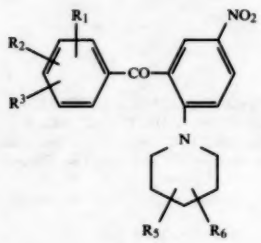
Continuation-in-part of Ser. No. 697,160, Feb. 1, 1985, abandoned, which is a division of Ser. No. 391,915, Jun. 24, 1982, Pat. No. 4,528,294. This application May 30, 1986, Ser. No. 868,443

Claims priority, application France, Jun. 29, 1981, 81 12745

Int. Cl.[4] C07D *295/10, 211/52, 211/46, 211/14*

U.S. Cl. 546—235 **2 Claims**

1. A compound corresponding to the formula:



(I$_o$)

in which:

R_1 and R_2, which are identical or different, each represent an atom of hydrogen, a halogen, a lower alkyl group or a lower alkoxy group;

R_3 represents an atom of hydrogen;

R_5 and R_6, which are identical or different, each represent an atom of hydrogen, a lower alkyl group, an OH group, a phenyl group or a benzyl group, and

wherein at least one of R_1, R_2, R_5 and R_6 is other than hydrogen.

4,680,403

PROCESS FOR PRODUCING N-PROTECTED-α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Kunio Hisamitsu, Funabashi; Tadashi Takemoto, Kawasaki; Toyoto Hijiya, Yokosuka, and Satoji Takahashi, Yokkaichi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 806,811

Claims priority, application Japan, Jan. 17, 1985, 60-6304

Int. Cl.[4] C07D *307/22*

U.S. Cl. 546—247 **8 Claims**

1. A process for producing N-protected-α-L-aspartyl-L-phenylalanine methyl ester which comprises esterifying L-phenylalanine with methanol in the presence of a strong acid as catalyst, adding, to the resulting solution, an aqueous alkaline solution to neutralize the acid catalyst and a water-immiscible organic solvent to extract the free L-phenylalanine methyl ester thus formed, collecting the organic layer, and reacting the L-phenylalanine methyl ester dissolved in said collected organic layer with N-protected-L-aspartic anhydride.

4,680,404

BENZOPYRANS

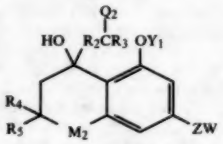
James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 457,171, Jan. 13, 1983, Pat. No. 4,486,428, which is a continuation-in-part of Ser. No. 358,751, Mar. 16, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,151

Int. Cl.[4] C07D *311/20, 405/04*

U.S. Cl. 546—269 **8 Claims**

1. A compound of the formula



where

M_2 is O, Q_2 is CN or $COOR_7$ where R_7 is hydrogen, alkyl having from one to four carbon atoms or benzyl; Y_1 is hydrogen, alkyl having from one to four carbon atoms, benzyl, benzoyl or alkanoyl having from one to five carbon atoms;

R_2 and R_3 are each hydrogen, methyl or ethyl;

R_4 is hydrogen, alkyl having from one to six carbon atoms or $—(CH_2)_z—C_6H_5$ where z is an integer from one to four;

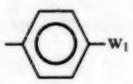
R_5 is hydrogen, methyl or ethyl;

Z is selected from the group consisting of

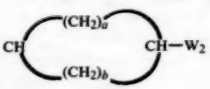
(a) alkylene having from one to nine carbon atoms;

(b) $—(alk_1)_m—X—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and

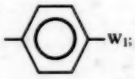
W is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

4,680,405

PROCESS FOR PREPARING 2-[(N-2-PYRIDYLCARBOMOYL)METHYL]SACCHARIN

Vincenzo Iannella, Viale Bianca Maria 20, Milan, Italy

Division of Ser. No. 631,616, Jul. 17, 1984, Pat. No. 4,587,335, which is a division of Ser. No. 385,175, Jun. 4, 1982, Pat. No. 4,474,955. This application Feb. 10, 1986, Ser. No. 828,037
Claims priority, application Italy, Jul. 17, 1981, 22364 A/81; Aug. 7, 1981, 23432 A/81
Int. Cl.[4] C07D *417/12*
U.S. Cl. 546—270 7 Claims

1. A process for preparing 2-[(N-2-pyridylcarbomoyl)methyl]saccharin (IX) comprising reacting a mixture of 2-carboxymethyl saccharin (VIII), 2-aminopyridine (IV) and tri-n-butylamine, in dichloromethane, with 1-methyl-2-chloropyridine iodine (X); and recovering the resulting 2-[(N-2-pyridylcarbomoyl)methyl]saccharin (IX).

4,680,406

PROCESS FOR FLUORINATING HALOGENATED ORGANO-COMPOUNDS

George S. Fujioka, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1985, Ser. No. 787,190
Int. Cl.[4] C07D *211/72*; C07C *17/20, 19/08, 21/24*
U.S. Cl. 546—345 5 Claims

1. A process for preparing a fluorine-containing compound from a halogen-containing organic compound comprising:

(a) injecting hydrogen fluoride into a liquid pool of aliphatic or aromatic reactant containing at least one halogen which is not fluorine,

(b) removing from said liquid pool a volatilized mixture of said aliphatic or aromatic reactant and hydrogen fluoride;

(c) passing said mixture of reactant and hydrogen fluoride over a catalyst bed to facilitate formation of a fluorine-containing compound; and

(d) recovering said fluorine-containing compound from said catalyst bed.

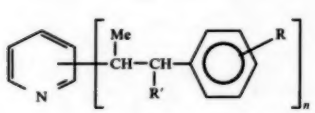
4,680,407

CERTAIN ALKALI METAL BIS-PHENETHYL OR TRIS-PHENETHYL-PYRIDINES USEFUL AS MULTIFUNCTIONAL ANIONIC INITIATORS

Arnaldo Roggero, S. Donato Milanese, Italy, assignor to Enichem Elastomeri S.p.A., Palermo, Italy

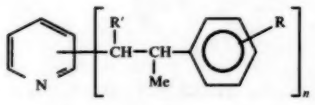
Filed Dec. 3, 1984, Ser. No. 677,344
Claims priority, application Italy, Dec. 5, 1983, 24019 A/83
Int. Cl.[4] C07D *213/24*
U.S. Cl. 546—348 7 Claims

1. A multifunction anionic initiator of the formula



(I)

or



wherein

Me=an alkali metal

R'=hydrogen or a C_{1-12} alkyl group; and

n=an integer of 2 or 3.

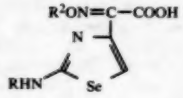
4,680,408

ACYL DERIVATIVES

Roland Reiner, Basel, and Urs Weiss, Pratteln, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 600,930, Apr. 16, 1984, abandoned, which is a division of Ser. No. 305,870, Sep. 28, 1981, Pat. No. 4,458,072. This application Jun. 9, 1986, Ser. No. 872,320
Int. Cl.[4] C07D *293/06*
U.S. Cl. 548—100 2 Claims

1. A compound of the formula



VII

wherein R is a cleavable group selected from the group consisting of t-butoxycarbonyl, trityl, trifluoroacetyl, chloroacetyl, bromoacetyl and iodoacetyl and R^2 is hydrogen, lower alkyl or $COOR^3$-lower alkyl, wherein R^3 is hydrogen, a cation of a base or a readily hydrolyzable ester group selected from the group consisting of lower alkanoyloxyalkyl, lower alkoxycarbonyloxyalkyl, lactonyl, lower alkoxymethyl, lower alkanoylaminomethyl, benzyl and cyanomethyl, and reactive functional derivatives of these compounds selected from the group consisting of halides, azides, anhydrides, reactive esters and amides thereof.

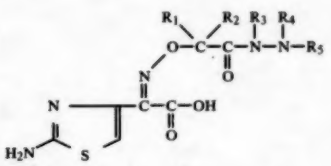
4,680,409

HYDRAZIDE CONTAINING DERIVATIVES OF 2-AMINO-4-THIAZOLE-ACETIC ACID

Uwe D. Treuner, Regensburg, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 658,849, Oct. 9, 1984, Pat. No. 4,610,824. This application Dec. 23, 1985, Ser. No. 812,658
Int. Cl.[4] C07D *277/40*
U.S. Cl. 548—194 4 Claims

1. A compound having the formula

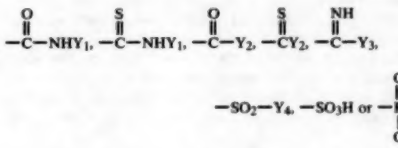


wherein

R_1 and R_2 are each independently hydrogen or alkyl of 1 to 4 carbon atoms, or R_1 and R_2 together with the carbon atom to which they are attached form a cycloalkyl ring;

R_3 is hydrogen or alkyl;

R_4 is hydrogen or alkyl, and R_5 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl,



(I')

or together R_4 and R_5 are =CH-Y_7; wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, methylcarbonyl, trifluoromethylcarbonyl, phenylcarbonyl, (substituted phenyl)carbonyl, carboxymethyl, methylsulfonyl, phenyl-

sulfonyl, (substituted phenyl)sulfonyl, aminocarbonyl, aminocarbonylamino, aminoethyl, hydroxy, alkoxy, amino, alkyamino, dialkyamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, 1-pyrrolidinyl or 1-piperidinyl; Y_2 is hydrogen, alkyl, phenyl, substituted phenyl, alkoxy, formyl, carbonyl, aminocarbonyl, aminothiocarbonyl, methylaminocarbonyl, methylaminothiocarbonyl, trifluoromethyl, phenylmethyl, (substituted phenyl)methyl, phenyloxymethyl, (substituted phenyl)oxymethyl, cyanomethyl, hydroxmethyl, alkoxymethyl, aminomethyl, methylcarbonylaminomethyl, aminocarbonylaminomethyl, methylsulfonylaminomethyl, carboxymethyl, aminocarbonylmethyl, alkoxycarbonylmethyl, hydroxyaminocarbonylmethyl, or azidomethyl;

Y_3 is amino, alkyl, alkylthio, carboxythio, alkoxycarbonylthio or aminocarbonylthio;

Y_4 is alkyl, amino, hydroxyamino, alkoxyamino, methylcarbonylamino, or phenylcarbonylamino;

Y_5 is hydrogen or alkyl;

Y_6 is hydrogen, alkyl, carboxymethyl, or aminocarbonylmethyl; and

Y_7 is phenyl or substituted phenyl;

wherein

the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or carboxyl groups.

4,680,410

PREPARATION OF N- AND S-1,2-ETHYLENICALLY UNSATURATED ORGANIC COMPOUNDS

Pen C. Wang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1984, Ser. No. 585,945

Int. Cl.[4] C07D *207/12, 263/04, 261/02, 231/04*

U.S. Cl. 548—231 **14 Claims**

1. A process for the preparation of a compound selected from the group consisting of N- and S-1,2-ethylenically unsaturated organic compounds which comprises

(a) contacting a compound selected from the group consisting of N- and S-silylated organic compounds with an aldehyde, wherein the aldehyde has a hydrogen atom bonded to the carbon adjacent to the carbonyl moiety, at elevated temperatures under conditions such that a compound selected from the group consisting of N- and S-siloxyalkyl-substituted organic compounds is prepared; and

(b) pyrolyzing the compound selected from the group consisting of N- and S-1-siloxyalkyl-substituted organic compounds under conditions such that the siloxy moiety is eliminated to prepare the compound selected from the group consisting of N- and S-1,2-ethylenically unsaturated compounds.

4,680,411

PYRANO[2,3-G]INDOLES USEFUL AS ANTI-ULCEROUS, ANTI-INFLAMMATORY AND ANTALGIC AGENT

Francois Picart, Dijon, France, assignor to Societe de Recherches Industrielles, Paris, France

Division of Ser. No. 276,643, Jun. 23, 1981, Pat. No. 4,436,915. This application Mar. 12, 1984, Ser. No. 588,566

Claims priority, application France, Jun. 26, 1980, 80 14246

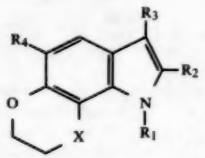
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] C07D *491/06;* **A61K** *31/40*

U.S. Cl. 548—430 **8 Claims**

1. Pyranoindole compounds selected from the group consisting of:

(i) pyrano[2,3-g]indoles of the formula: and



(ii) pharmaceutically acceptable acid addition salts thereof: in which:

X represents a group CH_2, CHOH, or CO;

R_1 represents an atom of hydrogen, a lower alkyl group, or an aminoalkylene group $-(CH_2)_n-NR'R''$ (in which n is a whole number between 1 and 4 and R′ and R″ which are identical or different, each represent H or a lower alkyl);

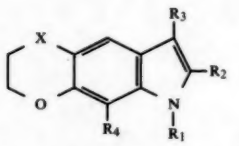
R_2 represents an atom of hydrogen;

R_3 represents an atom of hydrogen, a CHO group, CO—CONR′R″ (in which n, R′, R″ are defined as hereinabove), or $(CH_2)_nNH'R_4$ (in which R′ and R″ are CH_3 and n is 1); and

R_4 represents an atom of hydrogen, halogen, or a lower (C_1–C_4) alkoxy.

2. Pyranoindole compounds selected from the group consisting of:

(i) the pyrano[3,2-f]indoles of the formula; and



I′o

(ii) pharmaceutically acceptable acid addition salts thereof: in which:

X represents CH_2;

R_1 represents an atom of hydrogen;

R_2 represents an atom of hydrogen;

R_3 represents an atom of hydrogen, or a CHO group; and

R_4 represents an atom of hydrogen, or an atom of halogen.

4,680,412
PREPARATION OF FLUOROPHTHALIMIDES

Gerhard Hamprecht, Weinheim; Juergen Varwig, Heidelberg, and Wolfgang Rohr, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

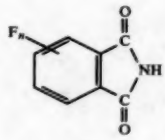
Filed May 31, 1984, Ser. No. 615,806

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320089

Int. Cl.[4] C07D *209/48*

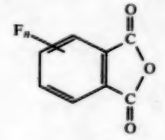
U.S. Cl. 548—480 **4 Claims**

1. A process for the preparation of a fluorophthalimide of the formula



I

where n is 1 or 2, which comprises: reacting a fluorophthalic anhydride of the formula



II

where n has the above meanings, with urea in the presence of a solvent at elevated temperatures, wherein from 0.4 to 0.8 mole of urea is used per mole of fluorophthalic anhydride, an aliphatic sulfone is employed as the solvent, and the reaction is carried out first at 110°–140° C. and then at 150°–170° C.

4,680,413
PROCESS FOR THE PRODUCTION OF 3-PHENYL-4-CYANOPYRROLES

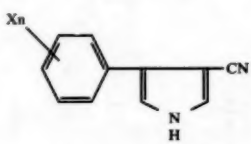
Yoshikazu Genda, Syogawa; Hiroyuki Muro, Shinminato; Kiyoharu Nakayama, Himi; Yoshiaki Miyazaki, and Yoshiji Sugita, both of Takaoka, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,893

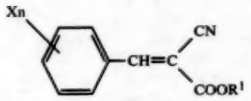
Int. Cl.[4] C07D *207/34, 405/04, 207/22*

U.S. Cl. 548—526 **1 Claim**

1. A process for the production of a compound having the formula:



which comprises a reaction of a compound having the formula:



with a compound having the formula

$R^2SO_2CH_2NC$

wherein

X is same or different substituent(s) selected from the group consisting of halogen, C_{1-6}alkyl, C_{1-6}haloalkyl, C_{1-6}alkylamino, C_{1-6}alkoxy, nitro, cyano and methylenedioxy;

$COOR^1$ is carboxylic acid or ester;

R^2 is C_{3-10}cyclic hydrocarbon which may be substituted by substituent(s) not giving negative effects to said reaction;

n is 0, 1 or 2.

in an organic solvent in the presence of base(s).

4,680,414
SUBSTITUTED-3-(2,3-DIHYDRO-1H-INDEN-5-YL)-4-HYDROXY-1H-PYRROLE-2,5-DIONES

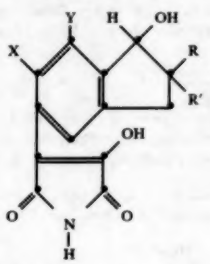
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 605,734, May 1, 1984, Pat. No. 4,604,403. This application Feb. 20, 1986, Ser. No. 832,488

Int. Cl.[4] C07D *207/40;* **A61K** *31/40*

U.S. Cl. 548—544 **5 Claims**

1. A compound of the formula:



in which R and R′ are different entities and wherein X and Y are each selected from methyl and chloro;

R is $(C_3–C_6)$ cycloalkyl, $(C_3–C_6)$ cycloalkyl-lower alkyl, phenyl, methoxyphenyl, hydroxyphenyl, thienyl, benzyl, phenethyl, lower alkyl, lower alkenyl, lower alkynyl;

R′ is lower alkenyl; lower alkynyl or lower alkyl, provided that R is not cycloalkyl or lower alkyl when R′ is lower alkyl and X and Y are both chloro, and the pharmaceutically acceptable salts thereof.

4,680,415
INTERMEDIATES FOR 7-FLUORO DIHYDRO PGI COMPOUNDS

George W. Holland, North Caldwell; Hans Maag, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

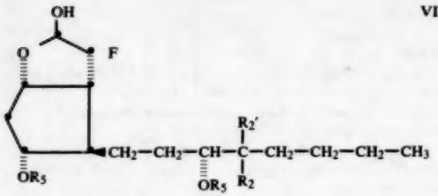
Division of Ser. No. 747,740, Jun. 24, 1985, Pat. No. 4,634,782. This application Sep. 8, 1986, Ser. No. 885,993

Int. Cl.[4] C07D *307/935*

U.S. Cl. 549—214 **8 Claims**

1. A compound of the formula:

VIII



wherein R_2 is hydrogen, methyl or fluoro, R_2' is fluoro, hydrogen, trifluoromethyl, or methyl; R_5 is tri(lower alkyl)silyl; with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl;

optical antipodes or racemates thereof.

4,680,416

ANTIBIOTIC CL-1565 COMPLEX DERIVATIVES

Gerard C. Hokanson; Richard H. Bunge; Timothy R. Hurley, and James C. French, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 493,888, May 12, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,389

Int. Cl.[4] C07D *309/32*

U.S. Cl. 549—292 **3 Claims**

1. A compound having the name 5,6-dihydro-6-(3,4,6,13-tetrahydroxy-3-methyl-1,7,9,11-tridecatetraenyl)-2H-pyran-2-one.

3. A compound having the name 5,6-dihydro-5-hydroxy-6-(3,4,6,13-tetrahydroxy-3-methyltrideca-tetraenyl-2H-pyran-2-one.

4,680,417

2,6-DIOXO-2,6-DEHYDROBENZO[1:2-B,4:5-B]DIFURANS

Ronald W. Kenyon, Manchester, and Derek Thorp, Heywood, both of England, assignors to Imperial Chemical Industries Plc, London, England

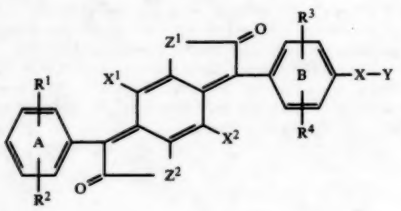
Filed Oct. 29, 1985, Ser. No. 792,645

Claims priority, application United Kingdom, Nov. 19, 1984, 8429170

Int. Cl.[4] C07D *493/14*

U.S. Cl. 549—299 **7 Claims**

1. A compound of the formula:



wherein,

Z^1 and Z^2 are —O—;

X^1 and X^2 are selected from H, halogen, cyano, C_{1-4}-aklyl, C_{1-4}-alkoxy, phenyl and phenyl substituted by a group selected from hydroxy, halogen, nitro, C_{1-4}-alkyl and C_{1-4}-alkyloxy, carbamoyl, sulphamoyl, or —$COOL^3$, wherein L^3 is selected from H, C_{1-4}-alkyl and phenyl;

R^1 to R^4 are each independently selected from H, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkenyl, halogen and the group —X—Y;

X is —O— or —S—; and

Y is C_{2-10}-alkenyl provided that,

the substitutents on rings A and B are different.

4,680,418

PROCESS FOR THE PRODUCTION OF A (1R,CIS)-4 ACETYL-6,6-DIMETHYL-3-OXABICYCLO-(3.1.0.)-HEX-2-ONE

Arun K. Mandal; Damodar G. Jawalkar, and Satish W. Mahajan, all of Maharashtra, all of India, assignors to IEL Limited, Calcutta, India

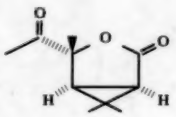
Filed Sep. 26, 1985, Ser. No. 780,651

Claims priority, application United Kingdom, Sep. 28, 1984, 8424561

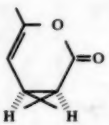
Int. Cl.[4] C07D *307/93*

U.S. Cl. 549—305 **10 Claims**

1. A process for the production of (1R,Cis)-4-acetyl-6,6-dimethyl-3-oxabicyclo-(3.1.0)-hex-2-one of the formula:



which comprises reacting (1R,Cis)-4,7,7-trimethyl-3-oxabicyclo(4.1.0.)-hept-4-en-2-one of the formula:



with bromine at a temperature of from 0° C. to 25° C. and treating the brominated reaction mixture at ambient temperature with water, an aqueous solvent solution or an aqueous base solution.

4,680,419

SPIROKETALS AND PROCESS FOR PREPARING SAME

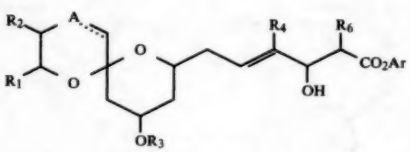
Stephen J. Nelson, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 22, 1985, Ser. No. 757,659

Int. Cl.[4] C07D *309/10, 309/30*

U.S. Cl. 549—343 **4 Claims**

1. A compound of Formula XIV



wherein A is —CH, or —CH_2';

wherein .... is a single bond when A is —CH_2' and a double bond when A is —CH;

wherein R_1, R_2, R_4, and R_6, being the same or different, are hydrogen or C_1–C_5 alkyl;

wherein R_3 is hydrogen; C_1–C_5 alkyl; benzoyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_3 alkoxy, halo, C_1–C_3 alkylthio, trifluoromethyl, nitro; phenyl(C_1–C_3)alkyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro or trifluoromethyl; C_2–C_6 alkoxyalkyl; C_2–C_6 alkylthioalkyl; C_1–C_6 alkanoyl; tetrahydropyranyl; C_1–C_4 alkyl diphenyl silyl; di(C_1–C_4 alkyl) phenyl silyl; or tri(C_1–C_4)alkyl silyl; and

wherein Ar is phenyl substituted at the 2-, 2,6- or 2,4,6-positions with C_1–C_5 alkyl.

4,680,420

PROCESS FOR THE PRODUCING 2,5-DIMETHOXYTETRAHYDROFURAN AND 2,5-DIETHOXYTETRAHYDROFURAN

Juan Andrade, Ridgewood, N.J., and Günter Prescher, Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,296

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544046

Int. Cl.[4] C07D *307/20*

U.S. Cl. 549—476 **7 Claims**

1. A process for producing 2,5-dimethoxytetrahydrofuran and 2,5-diethoxytetrahydrofuran, comprising reacting 4,4-dimethoxy-1-butanal or 4,4-diethoxy-1-butanal with a strongly acidic ion exchange resin at a temperature of between 0° and 70° C.

4,680,421

COMPOSITION AND METHOD FOR COKE RETARDANT DURING PYROLYTIC HYDROCARBON PROCESSING

David R. Forester, The Woodlands, and Dwight K. Reid, Houston, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 6, 1985, Ser. No. 773,402

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] C07C *4/02*

U.S. Cl. 585—648 **28 Claims**

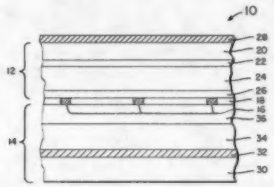
1. A method of inhibiting the formation and deposition of pyrolytic coke on the heated metal surfaces of the structural and associated parts of a pyrolysis furnace which is being used to crack a petroleum feed stock to produce lower hydrocarbon fractions and said metal surfaces thereof having a temperature of about 1600° F. or above, which method comprises adding to the feedstock before and/or during cracking thereof a coke inhibiting amount of an ammonium borate compound.

4,680,422

TWO-TERMINAL, THIN FILM, TANDEM SOLAR CELLS

Billy J. Stanbery, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 30, 1985, Ser. No. 792,942
Int. Cl.[4] H01L 27/14, 31/06
U.S. Cl. 136—249 49 Claims



1. A polycrystalline, tandem, photovoltaic transducer, comprising:

(a) an upper cell having a bandgap of about 1.7 eV and comprising a heterojunction of n-type CdSe and p-type ZnTe, the junction being formed by depositing the ZnTe on the CdSe at low temperatures below about 350° C.;

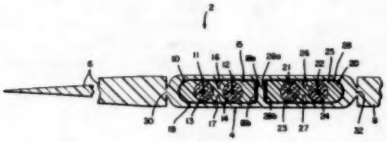
(b) a lower cell electrically connected to the upper cell, having a bandgap of about 1.0 eV, and comprising a thin film heterojunction between a graded ternary I-III-VI_2 semiconductor and a thin film II-VI semiconductor window layer.

4,680,423

HIGH PERFORMANCE FLAT CABLE

Glenn E. Bennett, Harrisburg, Pa.; Raymond J. Look, Largo, Fla.; Frank P. Dola, Hudson, Fla.; Richard E. Thurman, and Paul P. Siwinski, both of Seminole, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1985, Ser. No. 707,935
Int. Cl.[4] H01B 7/08, 11/00
U.S. Cl. 174—36 18 Claims



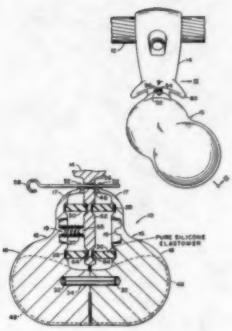
18. A high impedance, low cross-talk cable for use in transmitting high frequency signals comprising a plurality of signal conductors, spaced side by side in the same plane, each signal conductor being separately surrounded by first insulating material, a second insulating material surrounding the first insulating material, the dielectric constant of the first insulating material being less than the dielectric constant of the second insulating material, the second insulating material imparting dimensional stability to the signal conductors, the second insulating material individually surrounding each signal conductor and the first insulating material therearound, the second insulating material comprising means for holding the signal conductors in parallel configuration along precisely spaced centerlines, an EMI shield surrounding the second insulating material, and a third insulating material, the EMI shield being encapsulated in the third insulating material.

4,680,424

OVERHEAD CONDUCTOR DAMPING DEVICE WITH DIE CAST COMPONENTS AND METHOD OF MAKING THE SAME

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1985, Ser. No. 805,818
Int. Cl.[4] H02G 7/14
U.S. Cl. 174—42 20 Claims



1. A device for damping vibrations of an overhead conductor, comprising:

a clamp arm,

a die cast weight and housing comprised of opposed weight and housing halves located on opposed sides of said clamp arm and having spherical outer surfaces to minimize corona and tooling costs,

a window provided in the weight and housing for accommodating the clamp arm,

said clamp arm extending through said window,

tubular elastomer damping members located between and bonded to the clamp arm and weight and housing halves such that the damping members support the weight and housing halves on the clamp arm, and damping is effected by flexing of the damping members without occurrence of sliding movement between components of the damping device, and

means securing the weight and housing halves, clamp arm and damping members together.

19. A method of making a device for damping the vibrations of overhead electrical conductors, said method comprising the steps of:

providing hollow cylindrical-shaped elastomer damping members, said damping members having parallel planar ends,

providing parallel planar surfaces on opposed walls of a housing structure for housing the damping members and on opposed surfaces of a clamp arm for clamping to an overhead conductor,

applying a layer of substantially wet flexible adhesive to the planar surfaces of the housing structure and clamp arm,

locating the damping members between the planar surfaces of the housing structure and clamp arm in a manner that seats the ends of the damping members in the flexible adhesive, and

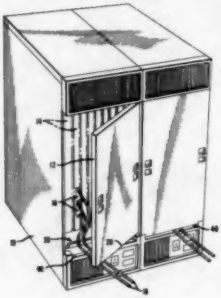
joining the ends of the damping members to the clamp arm and housing structure by pressing the ends against the layers of adhesive and allowing the adhesive to dry.

4,680,425

CABLE STRAIN RELIEF DEVICE

Floyd G. Speraw, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 19, 1985, Ser. No. 746,895
Int. Cl.[4] H01R *13/585*
U.S. Cl. 174—50 6 Claims



1. A cable strain relief device for protecting cables and their associated connectors from strains and other physical damage comprising:

a cabinet having at least one surface;

at least one cable having an associated connector connected to said cabinet;

a rigid U-shaped bracket for engaging and constraining the cable and having end portions projecting parallel to the bottom of the U-shape; and

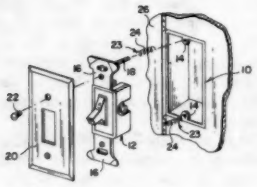
rigid means engaging said end portions, to permit said U-shaped bracket to pivot about said end portions, said means affixed to the at least one surface of said cabinet in a position proximate said at least one cable and its associated connector such that said U-shaped bracket fits over and constrains said at least one cable with a substantially 90° bend so that a pull force on said at least one cable will cause said at least one cable to engage and rotate said U-shaped bracket in a direction toward said at least one surface of said cabinet thereby squeezing said at least one cable between said U-shaped bracket and said at least one surface of said cabinet so as to prevent the transmission of the pull force to said associated connector.

4,680,426

ELECTRICAL SWITCHES

Ralph L. Hawker, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Aug. 19, 1985, Ser. No. 766,978
Int. Cl.[4] H02G *3/12*
U.S. Cl. 174—57 2 Claims



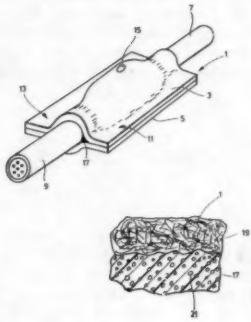
1. An improved outlet box with an electrical fixture, said outlet box being of the type having two mounting tabs, said electrical fixture of the type having two mounting straps, two mounting screws, a cover plate and at least one plate screw, wherein the improvement comprises means for biasing said electrical fixture in a forward position so that said electrical fixture can be mounted at a proper position with respect to a finished wall surface irrespective of the thickness of said wall and said cover plate can be mounted to said electrical fixture by said at least one plate screw, wherein said biasing means includes two deflection spools, each said spool being of a flexible material and having a hollow barrel with a plurality of vertical slots therein, said barrel is circumposed about one of said mounting screws between said mounting tab and said mounting strap for biasing said electrical fixture in a forward position.

4,680,427

FIRE RESISTANT CAST CABLE CONNECTION

Gunther John, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 15, 1985, Ser. No. 765,680
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432158
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—88 R 7 Claims



1. A cast cable connection comprising cables with their conductors interconnected, and surrounding said conductors, a housing containing a cured filler resin therein, said housing comprising flexible fiberous ceramic material bound together by a fire resistant inorganic binding agent, said housing being sufficiently porous to provide increased adhesion between said housing and said filler resin and to provide a substantially integral unit therebetween.

4,680,428

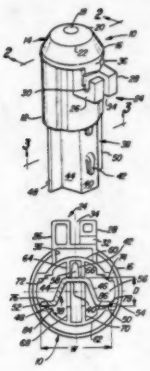
ELECTRIC FENCE INSULATOR CAP

Robert M. Wilson, Jr., Battle Creek, Mich., assignor to Dare Products, Inc., Battle Creek, Mich.

Filed Aug. 22, 1986, Ser. No. 899,164
Int. Cl.[4] H01B *17/14;* A01K *3/00*
U.S. Cl. 174—158 F 4 Claims

1. A fence post cap for installation on the top of a U-post, said U-post having legs which diverge from a central flat bight portion to outwardly extending flanges in a plane parallel to said central bight portion, said bight portion having longitudinally spaced outwardly extending fastening lugs, said cap comprising: a tubular body having an oblong cross-section with its wall symmetrical about a longer and a shorter axis at right angles to each other; a sloped top closing one end of said tubular body; two opposed pairs of adjacent longitudinally extending parallel ribs projecting inwardly from said wall parallel to said shorter axis with one rib of each pair being on each side of said shorter axis, the ribs of each pair being spaced apart a distance sufficient to receive a fastening lug therebetween; stepped ledges extending inwardly from said wall sym-

metrically arranged on both sides of said shorter and longer axes and parallel to said longer axis; whereby said cap can be driven onto said U-post by impacting said top, at least one of said ribs then contacting the flat bight portion of said post and each of said post flanges then contacting one of said stepped



ledges for guiding said cap, and said cap then being retained on said post by the coaction of the cap wall against the ends of said flanges or the coaction of at least one of the ribs acting on the bight portion and the stepped ledges acting on the flanges of said U-post.

4,680,429

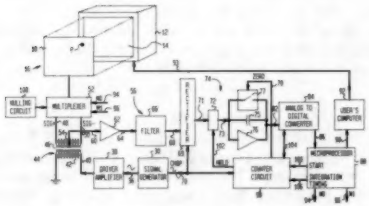
TOUCH PANEL

Bruce Murdock, Beaverton, and Daniel G. Teichmer, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 15, 1986, Ser. No. 819,949

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **27 Claims**



1. A touch panel device for determining the touch location at which a touch sensing surface of the device is touched comprising:

signal generator means for producing an alternating-current voltage output;

transformer means having a primary winding means connected to the signal generator output so as to be driven by the signal generator means, the transformer means also having a secondary winding means with first and second secondary winding outputs and a center tap, the secondary winding means providing a panel scanning signal as the primary winding means is driven by the signal generator output;

switching means for selectively coupling the secondary winding means to the touch sensing surface so as to selectively apply the panel scanning signal to the touch sensing surface and generate touch current signals at the center tap upon touching of the panel; and

panel output signal processing means having a first input coupled to the center tap of the transformer means for receiving the touch current signals, the panel output signal processing means comprising means for determining the touch location from the touch current signals.

4,680,430

COORDINATE DETECTING APPARATUS

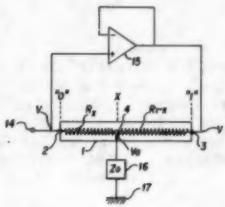
Kazuo Yoshikawa, Atsugi; Toru Asano, Kawasaki; Hisashi Yamaguchi, Atsugi; Hideaki Takizawa, and Shizuo Andoh, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 27, 1985, Ser. No. 706,224

Claims priority, application Japan, Feb. 29, 1984, 59-37919; Feb. 29, 1984, 59-37914; Feb. 29, 1984, 59-37915

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **20 Claims**



1. An apparatus for detecting the coordinate of a point on a plane, comprising:

a resistive film means forming the plane, said resistive film means having an effective region used for the coordinate detection, said effective region being substantially rectangular and having a pair of ends disposed in a direction in parallel to a relevant coordinate axis;

a buffer means having an input and an output, said input being connected to one end of said film means and said output being connected to the other end of said film means, said buffer means having substantially infinite impedance and unit voltage gain; and

measuring means connected to said input of said buffer means, to measure an impedance between an end of said film means and ground,

wherein the point, whose coordinate on the plane is to be detected, is indicated by applying a load to the point.

4,680,431

DATA NETWORK INTERFACE MODULE WITH CIRCUITRY FOR DISCONNECTING A MODULE THAT HAS LOST SUPPLY VOLTAGE

Werner Flach, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,325

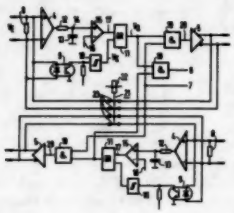
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445521

Int. Cl.[4] H04L *25/02*; H04B *3/44*

U.S. Cl. 178—69 R **13 Claims**

1. An interface module for connecting a bus station with a data network, comprising a first receive portion for receiving a first input signal from a first input line on the data network, the first input signal being capable of at least one of a plurality

of valid states including a first ready state, the first receive portion comprising means for simulating the first ready state at



the output of the first receive portion if the first input signal is not in a valid state.

4,680,432

COMPACT ELECTRONIC DEVICE

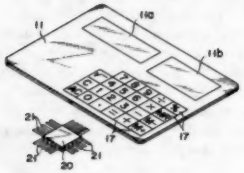
Kazuhiro Sugiyama, and Yoshio Kawai, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,849

Claims priority, application Japan, Aug. 7, 1984, 59-165062; Aug. 7, 1984, 59-165063; Aug. 7, 1984, 59-0165064

Int. Cl.[4] H01H *3/12*

U.S. Cl. 200—5 A **42 Claims**



1. A method for fabricating a key switch comprising the steps of:

forming a first conductive layer on a first surface;

forming connecting terminals on said first surface;

forming a first conductive pattern on said first surface for connecting said first conductive layer with some electrodes of an electronic component and for connecting other electrodes of the electronic component with said connecting terminals;

forming an insulating layer covering said first conductive pattern but leaving the connecting terminals and the first conductive layer exposed;

forming a plurality of anisotropically electrical conductive islands on said first conductive layer;

forming a second conductive layer on said islands; and

forming a second conductive pattern on a side of said insulating layer opposite from the first conductive pattern for connecting said second conductive layer to said connecting terminals.

4,680,433

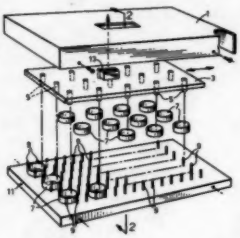
CONTACT ASSEMBLY FOR A SWITCH

Donald H. MacAdam, Ancaster, Canada, assignor to Annulus Technical Industries, Inc., Ancaster, Canada

Filed Jan. 7, 1986, Ser. No. 816,822

Int. Cl.[4] H01H *1/12, 15/06, 21/76*

U.S. Cl. 200—16 D **17 Claims**



1. A contact assembly for a switch, comprising a resiliently deformable loop of conductive material, and a plurality of fixed abutments unattached to the loop extending perpendicular to the plane of the loop and defining a path of movement for the loop, in passing along which path the loop is stressed by passing between at least two abutments, the location of the abutments being such that the stress of the loop as it moves along the path exhibits minima and maxima at defined locations, at least certain of the abutments providing electrical contacts to the loop such as to complete at least one electrical circuit through the loop at at least one defined location corresponding to a stress minimum, and in which the stress maxima is defined by at least two abutments.

4,680,434

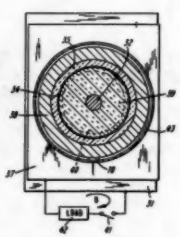
EXPLOSIVE-DRIVEN, HIGH SPEED, ARCLESS SWITCH

Phillip J. Skogmo, and Tillman J. Tucker, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1986, Ser. No. 859,164

Int. Cl.[4] H01H *39/00*

U.S. Cl. 200—61.08 **14 Claims**



1. An explosive-actuated, single-use, fast-acting, arcless switch for a high current circuit, comprising:

a frangible conductive foil element having opposed first and second surfaces providing a low impedance path between an input and an output for a high current in said circuit;

a hard dielectric surface positioned against the first surface of said frangible foil and provided with a predetermined pattern of grooves, the surface between said grooves extending from said input to said output; and

explosive force-generating means for generating an explosive force acting on the second surface of said frangible foil towards said grooved hard dielectric surface, said foil over said grooves being ruptured by said explosive force, thereby providing a current path only through the unruptured foil between said grooves to increase the impedance of said switch between said input and said output.

4,680,435

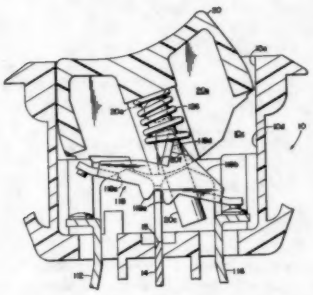
ROCKER SWITCH FOR SLIDING OR PIVOTING CONTACT LEVER

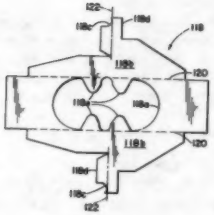
Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Mar. 11, 1986, Ser. No. 838,915

Int. Cl.[4] H01H *5/06, 21/42, 1/06*

U.S. Cl. 200—68.2 **4 Claims**





1. A switch comprising a base of insulating plastic and defining an upwardly open cavity, at least two fixed contacts spaced along the bottom wall of said base cavity, one of said fixed contacts having an upper edge defining a contact lever fulcrum and the other fixed contact defining an upwardly facing butt contact, a rocker actuator pivotably supported in said switch base for movement on a pivot axis defined in said base and located above said fulcrum, said actuator having a depending portion, a lower end of said depending portion extending downwardly below said fulcrum, said actuator having laterally spaced wall portions, a coil spring provided on said depending portion generally between said actuator wall portions, said spring having an upper end engaging a rocker defined land downwardly facing, a movable contact lever having a central saddle portion provided on said fixed contact fulcrum for pivotal movement of said lever between first and second limit positions, said contact lever having a butt contact spaced from said saddle portion for engaging selectively said fixed butt contact in a first limit position of said contact lever, said lever having a U-shaped cross section with an opening in the base of the U to provide clearance for said depending actuator portion, said U-shape contact lever further including laterally spaced wall portions, upper edges of said contact lever wall portions defining laterally spaced lands for engaging a lower end of said coil spring, said wall portions of said contact lever provided between said actuator wall portions, and means provided in part on said actuator wall portions and in part on said contact lever wall portions for achieving positive movement of said lever in response to movement of said rocker actuator.

4,680,436

PROXIMITY SWITCH IN MOUNTING ARRANGEMENT

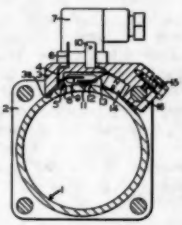
Walter Brausfeld, Hanover; Helmut Gottling, Isernhagen; Rudolf Moller, Gehrden; Peter Muller, Hanover, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 879,688

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523371; Mar. 21, 1986, 3609537

Int. Cl.[4] H01H *35/38*

U.S. Cl. 200—82 E **12 Claims**



1. A contactless proximity switch and mounting arrangement for determining the position of a movable member within a cylinder, said contactless proximity switch and mounting arrangement comprising:

(a) a switch housing mounted at a predetermined position on the cylinder;

(b) a contact opening formed in said switch housing having a portion thereof open toward an exterior surface of the cylinder;

(c) a permanent magnet disposed in said contact opening and having a first pole in contact with the exterior surface of the cylinder;

(d) a switch element having at least a first and second contact member being disposed in said contact opening, said first contact member being coupled to a second pole of said permanent magnet, and said second contact member being electrically connected to the exterior surface of the cylinder at a spaced-apart position relative to where said first pole of said permanent magnet contacts the exterior surface; and

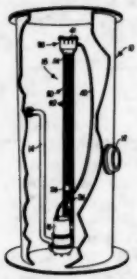
(e) the movable member being composed of a ferromagnetic material which, as the movable member nears to within a predetermined distance of such predetermined position, allows a magnetic field exerted by said permanent magnet to be conducted thereover such that such spaced-apart position between said first pole of said permanent magnet and said electrical connection to said second contact member is bridged thereby closing said first and second contact members.

4,680,437

ADJUSTABLE FLOAT ASSEMBLY FOR PUMPS

Nyle D. La Grange; Darryl M. Nielsen, both of Lenexa, Kans., and Joe A. Harbison, Gladstone, Mo., assignors to The Marley-Wylain Company, Mission, Kans.

Filed Jan. 13, 1986, Ser. No. 818,011
Int. Cl.[4] H01H 35/18
U.S. Cl. 200—84 R 13 Claims



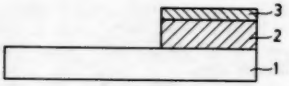
1. A fluid level indicator assembly comprising:
a support having a pair of elongated, upright wall portions spaced from each other to define an elongated channel therebetween which extends in an upright direction and which is open in horizontal directions;
an elongated electrical lead means extending through said open channel in a generally horizontal direction and having structure engaged with both of said wall portions; and
switch means electrically connected to said lead means and being operably responsive to the pressure of fluid, said spacing between said pair of wall portions being complementally configured to said lead means structure to engage said pair of wall portions to grippingly engage said structure at any one of a number of vertical, selected positions along the length of said channel while enabling said lead means in each of said positions to extend through said channel in a generally horizontal direction to thereby adjustably position the height of said switch means.

4,680,438

LAMINATED MATERIAL FOR ELECTRICAL CONTACTS AND METHOD OF MANUFACTURING SAME

Karin Witting, Maintal; Dieter Pöss, Hanau, and Rudolf Schnabl, Rodenbach, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,874
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509039
Int. Cl.[4] H01H 1/02
U.S. Cl. 200—268 6 Claims



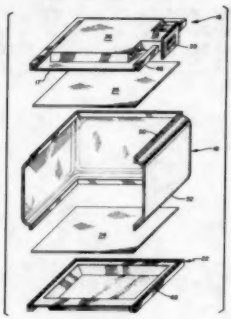
1. A laminated material for an electrical contact, comprising:
(a) a support of a base metal or base metal alloy;
(b) a contact layer of titanium nitride having a first and a second surface, said first surface being in contact with a surface of the support; and
(c) a mixed layer of titanium nitride and at least one noble metal selected from the group of gold, silver, palladium, platinum, ruthenium, rhodium and iridium, the mixed layer having a thickness of from about 1/10 to about 3/10 of that of the titanium nitride layer but not greater than about 0.45 micrometers, and having a noble metal content of from 40 to 95%, said mixed layer being in contact with said second surface.

4,680,439

PLASTIC MICROWAVE OVEN CAVITY

Ronald W. Millman, Bloomington, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1986, Ser. No. 869,214
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 R 8 Claims



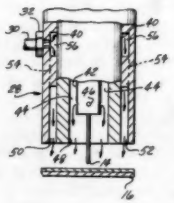
1. A plastic microwave oven cavity assembly comprising:
(a) a top and a bottom generally pan-shaped member, each having a microwave impermeable coating on the interior thereof; and
(b) a side wall member having a microwave impermeable coating on the exterior thereof;
wherein said top and bottom members are each joined to said side wall member by seam means for connecting the microwave impermeable coatings of said top, bottom and side wall members into a substantially continuously microwave impermeable surface sufficient to contain microwave energy within said cavity.

4,680,440

SHIELDING ARRANGEMENT AND METHOD FOR TIG

Loren E. Barlet, 58100 Romeo Plank Rd., Mt. Clemens, Mich. 48044

Filed Apr. 7, 1981, Ser. No. 251,797
Int. Cl.[4] B23K 9/16
U.S. Cl. 219—75 9 Claims



1. In an arc welding apparatus of the type including a weld-

ing electrode mounted within an electrode holder, a gas cup surrounding said electrode and carried by said holder, and means for supplying inert gas flow in a surrounding relationship to said electrode during welding operations to thereby achieve a shielding of said electrode, means for applying an electrical potential to said electrode to establish a welding arc and controls for initiating and terminating application of said electrical potential, said welding controls including means for initiatiang inert gas flow upon initiation of said welding arc, the improvement comprising:

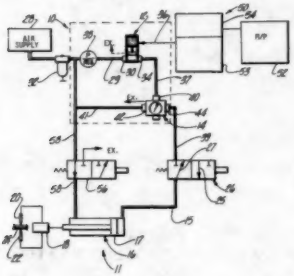
means for establishing a surrounding flow of hydrogen gas upon initiation of said welding arc, including an annular space creating a flow of said hydrogen in a cylindrical pattern radially outwardly spaced from and parallel to said inert gas flow and in surrounding relationship thereto, said means further including means responsive to activation of said welding controls to initiate said hydrogen gas flow whereby said hydrogen gas is ignited by intiation of said welding arc and forms completely surrounding curtain of burning hydrogen gas during said welding operations.

4,680,441

PRESSURE REGULATOR CONTROL SYSTEM

Lorne McKendrick, 365 W. Girard Ave., Madison Heights, Mich. 48071

Filed Jun. 29, 1984, Ser. No. 626,379
Int. Cl.[4] B23K *11/10*
U.S. Cl. 219—91.1 **6 Claims**



6. In combination with a pair of welding elecrodes and means for displacing said elecrodes into and out of engagement with a workpiece, said means for displacing comprising a cylinder having a piston slidably displaceable within the cylinder, a supply of pressurized air, and fluid passage means connecting said supply to said cylinder on at least one side of said piston,

the improvement comprising;

means for regulating the pressure delivered to said cylinder, said means for regulating comprising;

means for generating an electrical signal corresponding to a desired air pressure,

transducer means for establishing a first predetermined output pressure which is continuously variable in response to said electrical signal,

means for reducing the pressure of said pressurized air prior to said transducer,

air pilot operated pressure regulator means for establishing a second predetermined output pressure which is a discrete multiple of said first predetermined output pressure,

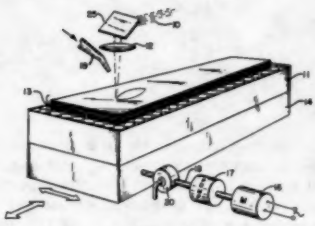
and valve means for selectively applying said second predetermined output pressure to said cylinder on one side of said piston.

4,680,442

APPARATUS FOR CUTTING MULTIPLE LAYERS OF FABRIC

Theodore J. Bauer, Hudson, Wis.; Donald P. Herke, Roseville, Minn.; Edward A. Bork, Star Prairie, and William E. Lawson, Somerset, both of Wis., assignors to Laser Machining, Inc., Somerset, Wis.

Filed Apr. 4, 1986, Ser. No. 848,218
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LG **3 Claims**



1. In combination in a laser cutting aparatus for cutting multiple sheets of fabric into patterns, the improvement comprising:

(a) a table having a plurality of knife edge support members extending upwardly and disposed to support a honeycomb structure;

(b) a honeycomb cellular structure having heat absorbing characteristics and having multiple vertically extending openings formed therein permitting substantially vertical airflow therethrough, said honeycomb structure being constructed and arranged to support multiple layers of limp fabric in flat contiguous relationship while said airflow moves through said openings;

(c) a source of vacuum pressure including vacuum pressure regulating means having at least a negative pressure of 5 inches H_2O;

(d) a focused laser beam directed downwardly from above said honeycomb structure and the layers of fabric, for burning a pattern in the multiple layers of fabric;

(e) a vacuum table supporting said honeycomb cellular structure and connected to said source of vacuum pressure, said airstream movement increasing as a result of said laser beam cutting the fabric and thereby creating an increase in air movement substantially in line with said laser beam; and

(f) said laser cutting apparatus being devoid of layer separating and liquid spraying means adjacent the focus of said laser beam.

4,680,443

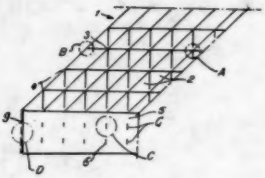
PROCESS AND APPARATUS FOR ELECTRON BEAM WELDING GRIDS FOR A NUCLEAR FUEL ASSEMBLY

Bernard Vere, Eybens, and Paul Mathevon, Bollene, both of France, assignors to Cogema, Framatome et Uranium Pechiney, France

Filed Mar. 12, 1985, Ser. No. 710,685
Claims priority, application France, Mar. 13, 1984, 84 03839
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 ED **11 Claims**

1. Method of welding a grid comprising a belt and two sets of strips whose end portions are fastened to said belt, comprising the steps of: placing said grid in a holding frame having passages for access to spots to be welded on two larger surfaces and on four sides of the grid; seizing said frame containing said grid with an orientation device for angular movement, supporting said orientation device with a cross motion table for movements in directions perpendicular to a line of welding radiation and moving said device to cause each spot to be

welded on a surface of said grid to pass through said line of welding radiation and energizing said welding radiation; repeating the movement and energization sequences after the frame has been tilted by 90° around a first axis perpendicular to the line of welding radiation by means of said orientation



device, in order to produce welds on all of the two surfaces and on two of said sides of said grid; and repeating the movement and energization sequences after the frame has been moved into two opposite orientations successively by tilting around a second axis at right angles to the first, in order to produce weldson the two last sides, and depositing the frame.

4,680,444

HAIRSETTER SYSTEM FOR ELECTRICALLY HEATING HAIR ROLLERS

Jorgen Skovdal, Trumbull; Daniel Santhouse, Stratford, both of Conn.; Borge Jensen, Kalundborg, Denmark, and Vito Carlucci, Stratford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 25, 1985, Ser. No. 726,865

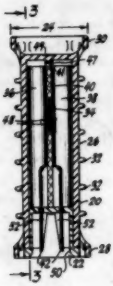
Int. Cl.[4] H05B *3/00;* **A45D** *2/36;* **H01R** *13/20;* **H01C** *7/02*

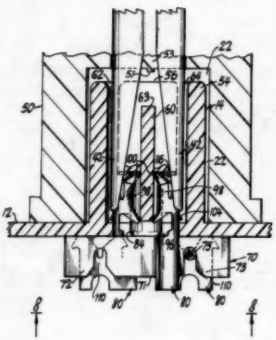
U.S. Cl. 219—222 **9 Claims**

1. In a hairsetter for electrically heating at least one hair roller, each said hair roller having an electrically activated internal heat generating material and a pair of plug members operatively electrically connected thereto and extending into a recess within one end of said roller, said hairsetter having at least one electrical socket member, each socket member including a pair of electrical contact pins receiving said pair of plug members, and means for completing an electrical connection between said contact pins of said socket member and a source of electrical power, the improvement wherein:

each said socket member comprises an electrically insulated socket housing for receiving the end of said roller having said recess, said housing having a first hollow cylindrical portion with an outside diameter smaller than the inside diameter of said recess and having a second cylindrical portion concentrically aligned within said first cylindrical portion in spaced relation to the inner surface thereof to form an annular space therebetween, a pair of radially extending diametrically opposed rib members connecting said first and second cylindrical portions to form the annular space therebetween into two arcuate spaces, each adapted to receive one of said plug members one of said contact pens being inserted into each of said arcuate spaces; and wherein

each of said plug members is tapered to a point of predetermined radius at the distal end thereof, each said plug member having along its length a curved surface of substantially uniform radius of curvature, the concave sides of each of said curved surfaces facing each other and





symmetrically situated about the longitudinal axis of said roller.

4,680,445

ELECTRONICALLY-CONTROLLED HEATING DEVICE FOR INFUSION LIQUIDS

Genshiro Ogawa, 13-3, Oaza Inuyama Aza Nishikoken, Inuyama-shi, Aichi-ken, Japan

Filed Sep. 6, 1985, Ser. No. 773,020

Claims priority, application Japan, Sep. 6, 1984, 59-187112; Nov. 12, 1984, 59-238185; Nov. 30, 1984, 59-182557[U]; Jan. 9, 1985, 60-1185[U]

Int. Cl.[4] H05B *1/02;* **A61F** *7/00;* **B67D** *5/62;* **F24H** *1/12*

U.S. Cl. 219—299 **5 Claims**

1. A device for heating infusion liquid, such as instillation liquid and blood transfusion liquid, to be injected to a human body, comprising:

a casing having an open top and a closed bottom, with an inlet cutout section and an outlet cutout section formed on one side wall thereof;

a liquid heating bag removably mounted within said casing and having an inlet end for connection to a source of liquid, an outlet end for connection to a human body, and a flow passage extending between said inlet and outlet ends in a zigzag line, said heating bag being disposed within said casing with said inlet and outlet ends received in said inlet and outlet cutout sections of said casing, respectively;

a first and a second heating plate mounted on the bottom of said casing, said first heating plate being adapted to heat a half part of the bag on the inlet side of said heating bag,

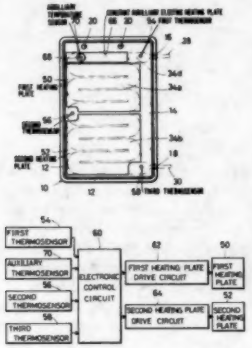
and said second heating plate being adapted to heat the other half part of the bag on the outlet side of said heating bag;

an openable cover connected to the top of said casing in coextensive relation thereto;

a push plate mounted on the inner surface of said cover and adapted to hold said heating bag against said first and second heating plates;

a first thermosensor located within said casing between said inlet cutout section and said first heating plate to measure temperature in the vicinity of the inlet of the bag;

a second thermosensor located within said casing between said first heating plate and said second heating plate to measure temperature in the vicinity of the middle of the bag;



a third thermosensor located within said casing between said second heating plate and said outlet cutout section to measure temperature in the vicinity of the outlet of the bag; and

control means located within said casing for controlling heating rates of said first and second heating plates, said control means including means for controlling said first heating plate in accordance with the temperature of the liquid in the vicinity of the inlet of the bag and the middle of the bag, as measured by said first and second thermosensors, respectively, and said control means further including means for controlling said second heating plate in accordance with the temperature of the liquid in the vicinity of the outlet of the bag, as measured by said third thermosensor.

4,680,446

SUPPLEMENTAL ELECTRIC WATER HEATER UNIT FOR COMPENSATING COOLING OF A HOT WATER SUPPLY LINE

Steven W. Post, 3310 Redwood Cove, Jonesboro, Ark. 72401

Filed Oct. 1, 1985, Ser. No. 782,460

Int. Cl.[4] H05B *1/02, 3/82;* **F24H** *1/20;* **F24D** *17/00*

U.S. Cl. 219—312 **16 Claims**

16. A hot water line accomodator for interposition between a hot water supply and a utility tap in proximity to the latter thereby to provide immediate hot water as needed, irrespective of standing line water temperature from the heater, comprising,

a receptacle for receiving line water and discharging heated water therefrom,

said receptacle having a discharge connection at the upper portion thereof adapted to be connected to a utility tap,

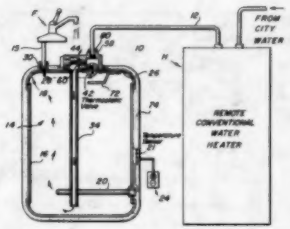
heating means for heating water in said receptacle,

means controlling said heating means in response to the temperature of water in said receptacle,

an inflow connection on said receptacle adapted to be connected to a hot water supply and having a thermostatic valve associated therewith,

said inflow connection having a first branch for directing water to the bottom portion of the receptacle and a second branch directing water to the upper portion of the receptacle,

said inflow connection having means cooperating with said thermostatic valve to close said second branch in response



to incoming water below a predetermined temperature and direct the water through said first branch toward the bottom of said receptacle, and to close said first branch in response to water above a predetermined water temperature and direct the water through said second branch into the top of said receptacle, whereby relatively cooler water will be heated by said heating means before exiting said discharge connection and relatively hotter water is enabled to pass directly to said discharge connection.

4,680,447

COOLED OPTICAL WINDOW FOR SEMICONDUCTOR WAFER HEATING

Imad Mahawili, Sunnyvale, Calif., assignor to Genus, Inc., Mountain View, Calif.

Continuation of Ser. No. 522,638, Aug. 11, 1983, Pat. No. 4,550,684. This application Jul. 19, 1985, Ser. No. 756,739

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—343 **11 Claims**

1. An apparatus for heating a wafer of semiconductor material comprising:

housing means for containing said wafer;

heating means external to said housing means for generating light for directly heating said wafer;

window means interposed between said heating means and said wafer, for transmitting said light into the interior of said housing means and in the direction of said wafer, said window means comprising a first wall and a second wall with a space therebetween for channeling the flow of cooling liquid, with said second wall forming at least a portion of the innermost surface of said housing means, and said walls arranged such that said light passes through both of said walls and through said cooling liquid before impinging on said wafer; and

fluid control means for actively cooling said second wall by pumping cooling liquid between said walls.

4,680,448

INFRARED SPACE HEATER

Earl L. Fester, Rte. 7, Box 307, Springfield, Mo. 65802

Filed Mar. 7, 1986, Ser. No. 837,254

Int. Cl.[4] H05B *1/00;* **F24H** *3/02*

U.S. Cl. 219—365 **20 Claims**

1. A space heater comprising:

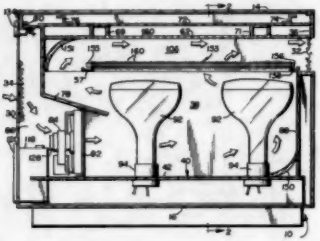
a casing having a cool air inlet and a heated air outlet;

a fan disposed within said casing adjacent said cool air inlet;

an electrically powered heat source disposed within said casing between said fan and said heated air outlet;

a heat exchanger mounted adjacent said electrically powered heat source;

air passageway defining means for defining a path of air movement through the casing from the cool air inlet, past the heat source, through and past the heat exchanger, and out the heated air outlet; and



said heat exchanger comprising a plurality of spaced parallel tubes of high heat conductivity material elongated in a dimension leading from the interior of said casing to said heated air outlet, and a plurality of spaced parallel fins of high heat conductivity material, said fins connected to said tubes and extending perpendicular thereto.

4,680,449

HEATER FOR HEATING HEAT SHRINKABLE TUBE

Takeshi Yamada, Sakura; Yasukuni Osato, Narashino, and Okosu Watanabe, Chiba, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,821
Claims priority, application Japan, Oct. 19, 1984, 59-219786
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—385 **6 Claims**

1. A heater for heating a heat shrinkable tube fitted over an elongated member, which heater comprises:

(a) a base having an elongated support plate of a thermally conductive material, adapted to support said elongated member carrying said heat shrinkable tube;

(b) a first heating portion at a central portion of said support plate defined by the presence of a heater element attached to the underside of said support plate;

(c) a second heating portion on said support plate defined by the end portions of said support plate extending outwardly in opposite directions from said first heating portion;

(d) a third heating portion defined by a pair of parallel spaced upright plates of thermally conductive material disposed on the top of said support plate and extending across said first heating portion coextensive with said support plate;

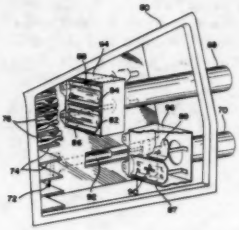
(e) whereby when said heater element is activated heat is transferred to said support plate, the central portion of said heat shrinkable tube above said first heating portion is heated first, so that said tube is heat shrunk at its central portion first and then towards its opposite ends.

4,680,450

APPARATUS FOR CONTROLLING THE HEATING OF COMPOSITE MATERIALS

Russell E. Thorson, Outagamie County, and Douglas J. Marver, Marathon County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 30, 1985, Ser. No. 760,441
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—388 **7 Claims**



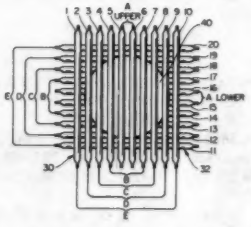
1. Apparatus for heating composite materials comprising at least one first source of radiant energy, means to regulate the wave length of radiant energy given off by said at least one first source of radiant energy, at least one second source of radiant energy, means to regulate the wave length of radiant energy given off by said second source of radiant energy and means to move material to be heated past said first and said second heat sources wherein said radiant energy is predominantly infrared energy, said at least one first source is regulated to emit a predominant wave length of 3.5 microns and said at least one second source is regulated to emit a predominant wave length of about 5.5 microns and said at least one second source is downstream from said at least one first source.

4,680,451

APPARATUS USING HIGH INTENSITY CW LAMPS FOR IMPROVED HEAT TREATING OF SEMICONDUCTOR WAFERS

Anita S. Gat, and Eugene R. Westerberg, both of Palo Alto, Calif., assignors to A. G. Associates, Sunnyvale, Calif.

Filed Jul. 29, 1985, Ser. No. 760,160
Int. Cl.[4] F27B *5/14*; H05B *1/02*
U.S. Cl. 219—411 **22 Claims**



1. Apparatus for heating semiconductor wafers of various diameters and establishing desired radial temperature gradients comprising

a first plurality of parallel lamps,

a second plurality of parallel lamps, said second plurality of lamps being spaced from and skewed with respect to said first plurality of lamps whereby a semiconductor wafer can be positioned therebetween,

means electrically connecting pairs of lamps in said first plurality of lamps beginning with innermost lamps and

extending outwardly and means electrically connecting pairs of lamps in said second plurality of lamps, beginning with innermost lamps and extending outwardly, and

means electrically interconnecting each pair of electrically connected lamps in said first plurality of lamps with a pair of electrically connected lamps in said second plurality of lamps whereby the interconnected pairs of lamps are simultaneously and equally energized to establish desired temperature gradients.

4,680,452

ELECTRIC HOTPLATE WITH A THERMOSTAT

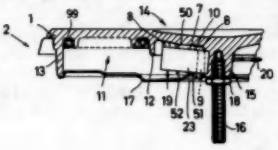
Karl Fischer; Felix Schreder, both of Oberderdingen, and Robert Kicherer, Knittlingen, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Division of Ser. No. 511,104, Jul. 6, 1983, Pat. No. 4,605,841. This application May 8, 1986, Ser. No. 861,083

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 8219461; Jul. 14, 1982, 3226264; Sep. 28, 1982, 8227145; Jan. 20, 1983, 3301689

Int. Cl.[4] H05B *3/68*

U.S. Cl. 219—449 **28 Claims**



3. An electric hotplate, comprising:

a hotplate body including a central zone without direct heating means applied thereto, and a heated outer zone provided with heating resistors;

electric circuitry for connecting the heating resistors to a source of electrical energy including a thermostat positioned on a bottom side of the hotplate body and having a casing made from an insulating material;

the casing of the thermostat having a recess with a snap-action switch and a bimetallic strip acting on the switch disposed in the recess;

an upper side of the casing being spaced at a distance from the bottom side of the hotplate body with the casing being mounted on the hotplate body, and the recess of the casing being open and uncovered on one whole side of the casing;

at least one projection projecting upwards at the upper side of the casing in the vicinity of the recess, the projection abutting against the bottom side of the hotplate body with the casing being mounted on the hotplate body;

ventilation gaps being provided between the upper side of the casing and the bottom side of the hotplate body for venting the snap-action switch and the bimetallic strip.

4,680,453

VEHICLE PERFORMANCE COMPUTER

R. Dell Pugh, 13622 Pine Villa La., Ft. Myers, Fla. 33912

Filed Feb. 14, 1986, Ser. No. 829,170

Int. Cl.[4] G06C *3/00*

U.S. Cl. 235—88 R **13 Claims**

1. A vehicle performance computer in the form of a circular slide rule for determining the relationship between the vehicle performance parameters of time, distance, braking, coasting, and acceleration as a function of vehicle weight, horsepower, speed, and roadway percent grade, said computer comprising:

substantially planar base having a center and also including:

a first logarithmic scale arcuately disposed about said base center and having indicia associated therewith representing the speed of the vehicle;

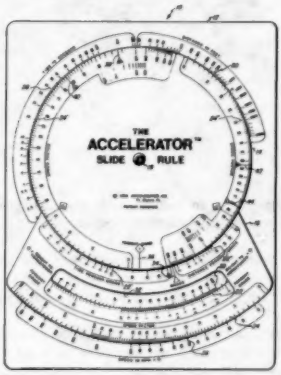
a second logarithmic scale arcuately disposed about said base center in a predetermined position with respect to said first logarithmic scale and having indicia associated therewith representing the weight-to-horsepower of the vehicle;

a third logarithmic scale arcuately disposed about said base center in a predetermined position with respect to said first and second logarithmic scales and having indicia associated therewith representing the required time for the vehicle to alter its speed from one particular speed to another;

a substantially planar intermediate slide having a center and rotatably mounted atop said base whereby both said centers are aligned, said intermediate slide including:

a fourth logarithmic scale arcuately disposed about said intermediate slide center and having indicia associated therewith representing the percent grade upon which the vehicle is traveling;

a window arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth logarithmic scale for viewing said second logarithmic scale therethrough in cooperative viewable alignment with said fourth logarithmic scale;



a fifth logarithmic scale arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth logarithmic scale in cooperative viewable alignment with said first logarithmic scale and having indicia associated therewith representing the speed factor of the vehicle as a percent of the maximum attainable stable vehicle speed in relation to a particular current vehicle speed on a particular percent grade;

a sixth logarithmic scale arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth and fifth logarithmic scales and having indicia associated therewith representing time percent grade in proportion to said fourth lagarithmic scale;

a brake tick mark disposed in a particular position to said sixth lagarithmic scale;

a substantially planar circular top slide having a center and rotatably mounted atop said intermediate slide whereby all three said centers are aligned, said top slide including:

a seventh logarithmic scale arcuately disposed about said top slide center in cooperative viewable alignment with said sixth logarithmic scale and said brake tick mark and having indicia associated therewith representing said speed factor;

a first percent grade tick mark disposed in a particular position with respect to said seventh logarithmic scale in

cooperative viewable alignment with said sixth logarithmic scale and said brake tick mark;

a braking time tick mark disposed in a particular position with respect to said seventh logarithmic scale and in cooperative viewable alignment with said third logarithmic scale for indicating on said third logarithmic scale a particular required time for the vehicle to brake to a particular speed;

a coast time tick mark disposed in a particular position with respect to said seventh logarithmic scale and in cooperative viewable alignment with said third logarithmic scale for indicating on said third logarithmic scale a particular required time for the vehicle to coast to a particular speed.

4,680,454

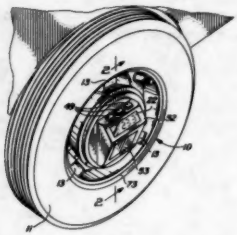
ODOMETER FOR GOLF CART

Robert E. Zeaman, 1727 W. Pershing, Phoenix, Ariz. 85029, and David E. Meyer, 7140 W. Mescal St., Peoria, Ariz. 85345

Filed Oct. 3, 1986, Ser. No. 914,944

Int. Cl.[4] G01C *22/00*; G06M *1/10*

U.S. Cl. 235—95 R **10 Claims**



1. An odometer for mounting on a wheel of power driven and/or hand moved golf carts comprising:

a frame,

means for securing said frame to a wheel of a golf cart for rotation therewith around its axis,

shaft means for attachment to said frame axially of the wheel of the golf cart,

said shaft means having a magnetic head mounted thereon for rotation therewith and a pendulum supported on said shaft means and independent of its movement,

a housing mounted on said pendulum,

said housing containing a sensor positioned adjacent said magnetic head for energization thereof by said magnetic head upon rotation of said frame, and

counting means mounted within said housing and energized by said sensor for actuation thereof upon rotation of said magnetic head,

said counting means comprises an indicator mounted on said housing for illustrating its count, and

switch means mounted on said housing for selectively resetting said counting means,

whereby the rotation of an associated golf cart wheel results in said counting means measuring the distance traveled by the golf cart.

4,680,455

METHOD OF MANIPULATING A CALCULATION AND DEVICE USED THEREWITH

Calven Kuo, Taipei, Taiwan, assignor to Aurora Mechatronecs Corp., Taipei, Taiwan

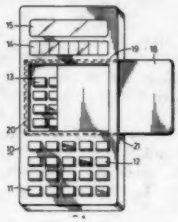
Filed Mar. 31, 1986, Ser. No. 846,178

Int. Cl.[4] G06C *7/02*

U.S. Cl. 235—146 **9 Claims**

1. A method of manipulating a calculator having a first face portion provided with numeral keys (11) and ordinary function keys (12) and a second face portion provided with special function keys (13), comprising the ordered steps of: selecting a desired auxiliary card from a set of such cards, said selected card having selected special function key manipulation instructions provided thereon; operatively superimposing said selected auxiliary card with the special function keys of the calculator; and manipulating the selected special function keys in accordance with the instructions on the selected auxiliary card.

5. A combination calculator and manipulation device, comprising:



a calculator body including numeral keys (11), ordinary function keys (12) and special function keys (13) provided thereon;

a set of auxiliary cards (17), each having different selected special function key manipulation instructions provided thereon; and

means for operatively superimposing a selected one of said auxiliary cards with said special function keys on said calculator body.

4,680,456

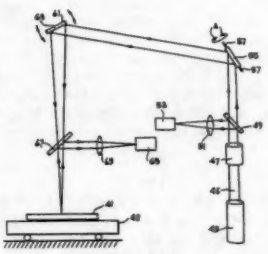
DATA SYSTEM EMPLOYING WALLET-SIZE OPTICAL CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 673,572, Nov. 21, 1984, Pat. No. 4,544,835, and Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, each is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,028

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—454 **1 Claim**



1. A system for sequentially recording transaction data by means of a laser comprising,

a wallet size card with a transparent plastic laminating material protectively bonded to a strip of erasable high resolution direct-read-after-write optically reflective read laser recording material adhered to one side of the card, being laser recordable in place on said card and having a mini-

mal laser recording capacity of 250,000 binary bits, having laser created data spots in a surrounding optically contrasting field of said strip, representing accumulated transaction data, with a dimension of said spots being less than 25 microns, the optical reflective contrast ratio of said spots with respect to the surrounding field being at least two to one,

laser means having a beam disposed in laser writing relation with respect to said strip for writing said spots, representing transaction data, the spots having a size of less than 25 microns,

a light detector means disposed in reading relation with respect to said strip for reading said spots, and

means for providing relative motion between the laser beams and the card for reading transaction data on the card and sequentially writing transaction data onto said card.

4,680,457

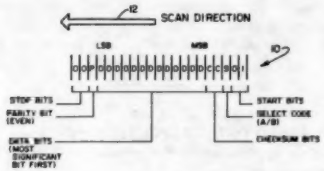
CODE READER

John A. Robertson, Chillicothe, Ohio, assignor to Telesis Controls Corporation, Chillicothe, Ohio

Filed Mar. 7, 1985, Ser. No. 708,974

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—470 **26 Claims**



1. Apparatus for reading a code provided as a word deriving sequence of radiation definable transitions carried on an object and selectively spaced from said first to last in accordance with a predetermined ratio defining first-bit and second-bit information, comprising:

imaging means for imaging at least a portion of said code carrying object for generating an imaged output signal having image signal transitions occurring in a time spaced sequence corresponding with said code sequence of spaced transitions;

signal treatment means responsive to said imaging means for converting said image signal transition into a corresponding train of pulses;

sequencer means for receiving said train of pulses and having a sequence of timing stages positioned from first to last for selectively delaying the transmission of said pulses therethrough to establish a sequence of pulse occurrence timing signals commencing with said train of pulses;

first sampling network means responsive to a given said timing signal established in conjunction with a sampling said timing stage positioned subsequent in said sequence from said first stage for deriving a valid first-bit condition following a first interval corresponding with a said time spaced sequence representing said first-bit select spacing and responsive to a next said timing signal occurring during said valid first-bit condition established at a next pulse said timing stage position prior in said sequence to said sampling timing stage to provide a first-bit datum;

second sampling network means responsive simultaneously with said first sampling network means to said given timing signal for deriving a valid second-bit condition following a second interval corresponding with a said time spaced sequence representing said second-bit select spacing and responsive to said next timing signal occurring during said valid second-bit condition established by said next pulse timing stage to provide a second bit datum;

serial-to-parallel alignment means responsive to each said first-bit datum and said second-bit datum in the sequence of their occurrence for deriving a serial alignment corresponding therewith defining a word and having a parallel output corresponding therewith representing said word; and

control means responsive to said parallel output for carrying out the decoding thereof.

4,680,458

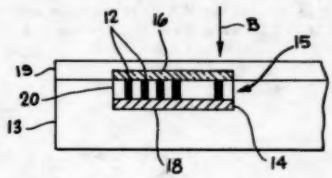
LASER RECORDING AND STORAGE MEDIUM

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, which is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Sep. 10, 1985, Ser. No. 774,563

Int. Cl.[4] G06K *19/00*

U.S. Cl. 235—487 **11 Claims**



1. An optical data recording and information storage medium comprising,

a transparent substrate and an overlying exposed and developed, high resolution emulsion layer, said emulsion layer containing prerecorded optically readable data spots, and

a vapor deposited, optically reflective, laser recording layer disposed over said emulsion layer, said layer capable of recording laser written spots having a dimension in the range between 2 and 50 microns written at speeds of at least 1000 bits per second.

4,680,459

UPDATABLE MICROGRAPHIC POCKET DATA CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 721,383, Apr. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 693,856, Jan. 22, 1985, which is a continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Nov. 14, 1985, Ser. No. 798,146

Int. Cl.[4] G06C *19/00*

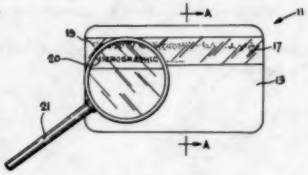
U.S. Cl. 235—487 **15 Claims**

1. An updatable micrographic data card comprising,

a wallet size card having a strip of optical contrast laser recording material disposed thereon,

a plurality of laser written micrographic characters disposed

on said strip, each character formed of a matrix of laser recorded character spots, said micrographic characters



being eye readable using at least 20 power magnification, but not eye readable using 5 power magnification or less.

4,680,460

SYSTEM AND METHOD FOR MAKING RECORDABLE WALLET-SIZE OPTICAL CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 673,572, Nov. 12, 1984, Pat. No. 4,544,835, and a continuation-in-part of Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, which is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,029

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—488 **6 Claims**

1. A method of making an optical data card comprising,

prerecording information on a strip of immediate read laser recording material,

adhering said strip to a wallet-size card base, said strip being laser recordable in place on said card,

bonding a protective transparent laminating material to the recording surface of said strip,

recording information on said strip with a laser through the laminating material and

reading said information of said strip with said laser as said information is written.

4,680,461

PICTURE INTENSIFIER TUBE WITH MEMORIZATION

Jean C. Boit, and Jean P. Galves, both of Paris, France, assignors to Thomson-CSF, Paris, France

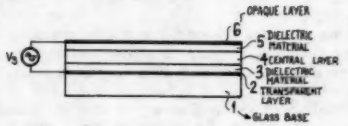
Continuation of Ser. No. 419,572, Sep. 17, 1982, abandoned. This application Sep. 12, 1985, Ser. No. 775,947

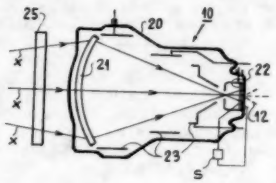
Claims priority, application France, Sep. 22, 1981, 81 17848

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **2 Claims**

1. A picture intensifier tube comprising a vacuum enclosure enclosing at opposite ends an input screen which is adapted to be irradiated with radiation corresponding to the image to be intensified and incorporates a photocathode for emitting electrons corresponding to the image, simultaneously over its entire emitting surface, and an output screen separated by space from the input screen and positioned to be bombarded by the emitted electrons for providing the intensified image, characterized in that the output screen comprises an electroluminescent cell which has a pair of opposed surfaces, is adapted for emitting visible light rays when an alternating voltage of amplitude larger than that of a characteristic threshold voltage is applied between its surfaces, has hysteresis such that so long as the applied voltage is maintained above an erasure voltage light emission is maintained even though the applied voltage drops below the characteristic threshold voltage, and has the





property that electron bombardment effectively augments the applied voltage so that even an applied voltage lower than the characteristic threshold voltage permits emission of visible light.

4,680,462

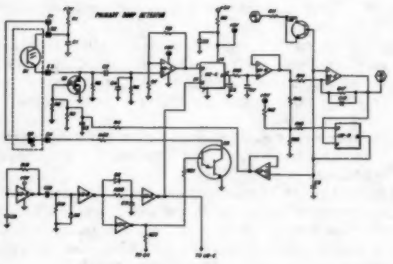
FLUID DROP DETECTION SYSTEM

Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 11, 1984, Ser. No. 680,487

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—222.1 **11 Claims**



1. A system, for detecting the presence of successive drops of fluid in a fluid drop path, comprising:

a system input for connection to a photoelectric transducer so situated as to have a change in electrical output upon the presence of a drop in the fluid drop path;

storage means, having an input in communication with the system input such that the input to the storage means is substantially equal to the output of the photoelectric transducer, for continuously storing and providing as an output a quantity related to the value of the photoelectric transducer output, the storage means further including gating means for gating off the storage means from the photoelectric transducer output on receiving a drop signal indicating the presence of a drop in the drop fall path so that the quantity stored and provided as an output by the storage means is related only to the value of the photoelectric transducer output in the absence of a drop; and

comparator means, connected to the storage means and in communication with the system input, for comparing the quantity stored in the storage means with the present value of the photoelectric transducer output and for providing output related to such comparison, wherein the output from the comparator means is in communication with the storage means.

4,680,463

APPARATUS FOR CHECKING CONTAINERS

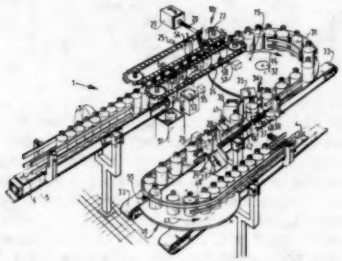
Pieter H. Lutgendorf, Deventer, and Gerrit J. Kleinnibbelink, Ugchelen, both of Netherlands, assignors to Hajime Industries Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,696

Claims priority, application Netherlands, Apr. 22, 1983, 8301420; Aug. 29, 1983, 8303007

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 250—223 B **14 Claims**



1. Apparatus for inspecting containers for defects, each container being of the type having a bottom and a neck presenting an open mouth and each defining an axis passing through its bottom and through its open mouth, which comprises the combination of transport means for traveling the containers along a predetermined path having a rectilinear portion, said transport means including, in said rectilinear portion of the path, means for suspending the containers from the necks thereof so that their axes travel along a line of the rectilinear path portion, sensing means for viewing along a vertical optical axis penetrating said rectilinear portion of the path and for generating a rejection signal in response to detection of each defective container, illuminating means for momentarily illuminating each container in coordinated relation to the passage of its axis relative to the position of said optical axis, and ejection means responsive to the rejection signals for ejecting the defective containers.

4,680,464

OPTICAL DETECTING SYSTEM FOR ARTICLE COUNTING MACHINE

Charles F. Bross, Chicago, Ill., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 27, 1985, Ser. No. 802,548

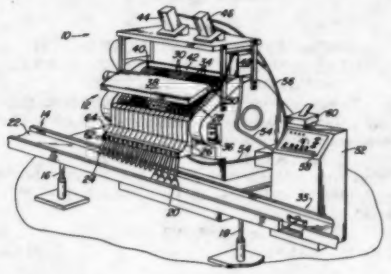
Int. Cl.⁴ G06M *7/02*; B65B *57/14*

U.S. Cl. 250—223 R **21 Claims**

1. In a machine for counting individual articles and delivering a preselected quantity of said articles into a plurality of receptacles arranged in a rank, the machine having an endless conveyor having elongated article receiving flights adapted to receive, transport and discharge the articles into the receptacles, each article receiving flight having a plurality of spaced article receiving locations therealong, each for receiving a single article and corresponding to one of said receptacles, apparatus for detecting the presence and absence of individual articles in said article receiving flights prior to discharge, comprising:

(a) illuminating means for illuminating said article receiving locations with an optical beam for producing optically-detectable indications of the presence or absence of an article in one or more individual article receiving locations,

(b) reflective means for displaying said optically-detectable indications,



(c) optical detector means operatively associated with said reflective means for detecting said indications and for generating an electronic signal representative of said indications, and

(d) processor means for processing said electronic signal and generating in response thereto a second electronic signal indicative of the presence or absence of an article in one or more individual article receiving locations.

4,680,465

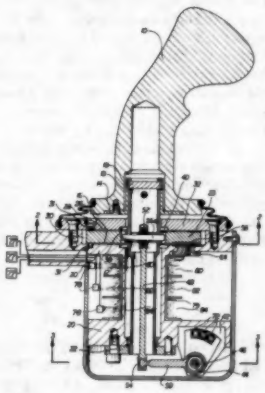
MULTI-AXIS FORCE CONTROLLER

Curtis E. Stevens, Irvine, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 23, 1984, Ser. No. 603,001

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—229 **15 Claims**



1. A controller that provides control signals in response to force commands, said controller comprising:

a body;

a flexure element having one end laterally and longitudinally fixed to said body;

a handle secured to the end of the flexure element opposite from said body such that force commands applied to said handle are transmitted to said flexure element,

a position ring concentrically arranged about said flexure element and maintained in said body, said ring being movable with respect to said body in a plane orthogonal to the longitudinal axis of the flexure element; and

position sensing means connected to said body and to said position ring, said sensing means being responsive to the movement of said position ring to provide control signals.

4,680,466

DISPLACEMENT TRANSDUCER WHICH SIMULTANEOUSLY EXTRACTS SIGNALS VIA SEQUENTIAL SWITCHING

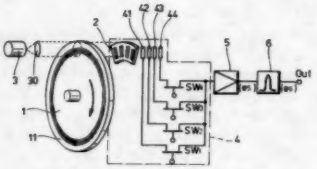
Hajime Kuwahara; Yutaka Ono, and Mitsuhiro Nikaido, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,088

Claims priority, application Japan, Apr. 20, 1984, 59-79564; May 10, 1984, 59-93650; May 10, 1984, 59-93651; May 10, 1984, 59-93652

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **11 Claims**



1. A displacement transducer comprising

a code disk comprising a plurality of light permeable slits formed therein and arranged with a first fixed pitch in the direction of displacement;

a light source for emitting parallel light beams which pass through said light permeable slits of said code disk;

an image sensor comprising a plurality of or a plurality of sets of light receiving elements, said plurality or plurality of sets being arranged with a second fixed pitch in the direction of displacement, said second pitch being larger than said first pitch, and switching means for successively extracting signals from each of said receiving elements in order of direction of displacement;

a band pass filter for extracting a fundamental wave component from the signals obtained from said receiving elements and switched by said switching means;

control means for driving said switching means with timing signals related to the fundamental wave frequency; and

phase measuring means for receiving output signals from said band pass filter and under the control of said control means for processing the output signals to measure the phase shift of the fundamental wave component at the zero point of the wave and producing signals indicative of the displacement of the code disk in proportion to the said phase shift.

4,680,467

ELECTRON SPECTROSCOPY SYSTEM FOR CHEMICAL ANALYSIS OF ELECTRICALLY ISOLATED SPECIMENS

Charles E. Bryson, III, Palo Alto, Calif., and Douglas L. Jones, Aloha, Oreg., assignors to Kevex Corporation, Foster City, Calif.

Filed Apr. 8, 1986, Ser. No. 849,478

Int. Cl.[4] H01J *49/08*

U.S. Cl. 250—305 **12 Claims**

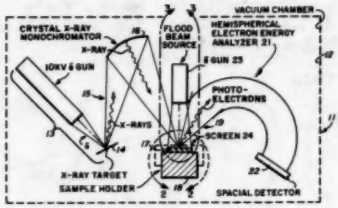
1. In a method for analyzing a specimen under analysis, the steps of:

bombarding an electrically isolated surface region of the specimen under analysis at subatmospheric pressure with a beam of ionizing radiation to produce secondary emission from the bombarded surface region of the specimen and to cause said bombarded surface region of the isolated specimen to have a resultant positive surface charge;

flooding the bombarded surface of the specimen with a stream of electrons to neutralize the region of positive surface charge;

positioning a transparent electrode overlaying the surface of the beam bombarded region of the specimen in spaced relation therewith, said electrode being at least partially transparent to the bombarding beam of radiation and to the resultant secondary emission;

operating the transparent electrode at a potential relative to



that of the surface of the specimen and relative to that of the flooding electron stream such that the flooding electrons pass through the transparent electrode on the way toward the specimen and are reflected in the region between the electrode and the specimen back through the transparent electrode; and

analysing the energies of the secondary emission emanating from the bombarded specimen and passing through the transparent electrode to obtain an indication of the chemical character of the bombarded surface region of the specimen under analysis, whereby the resolution of the secondary emission analysis is increased in use due to the operation of the transparent electrode.

4,680,468

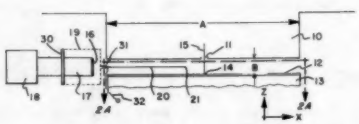
PARTICLE DETECTOR

Claude Bouchard, Nepean, and Pierre Boulanger, Vanier, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Aug. 5, 1985, Ser. No. 762,291

Int. Cl.[4] G01N *23/22*

U.S. Cl. 250—310 **16 Claims**



1. A detector for detecting secondary charged particles emitted by an area of a specimen in response to particle beam bombardment thereof, said area being located in a confined space, said detector comprising

(a) means including a particle detecting device for providing an output proportional to the number of said secondary charged particles received by such device,

(b) means for applying to the particle detecting device a first voltage of opposite sign to that of the charge on the secondary particles,

(c) a grid located between the detecting device and the bombardment area,

(d) means for applying to the grid a second voltage no greater than, and of the same sign as, the first voltage, and

(e) an elongate probe projecting into the vicinity of said bombardment area in said confined space, and

(f) means for applying to the probe a third voltage no greater than, and of the same sign as, the second voltage whereby to set up an electrostatic field around said probe to cause said secondary charged particles to orbit the probe and travel to the detecting device.

4,680,469

FOCUSING DEVICE FOR A TELEVISION ELECTRON MICROSCOPE

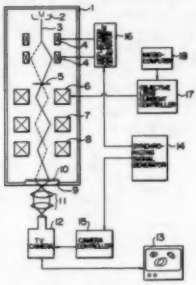
Setsuo Nomura, Tokyo, and Shigeto Isakozawa, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,272

Claims priority, application Japan, Aug. 17, 1984, 59-170471; Sep. 19, 1984, 59-194672

Int. Cl.⁴ H01J *37/26*

U.S. Cl. 250—311 **8 Claims**



1. A focusing device for a transmission type electron microscope displaying an enlarged image of a sample on a television, comprising:

means for changing alternately the incident angle of the electron beam on the sample in response to incident angle control signals having a predetermined frequency;

electron lens means for focusing the electron beam at a predetermined position by deflecting the electron beam passing through the sample;

a television apparatus for visualizing and displaying the image thus formed;

a focal point adjustment means for adjusting the focal length of said electron lens means on the basis of the image of said television apparatus and for forming an enlarged image of the sample at said predetermined positon; and

a signal generator means for feeding said television apparatus with vertical scanning signals and said means for changing alternately the incident angle of the electron beam with incident angle control signals having said predetermined frequency in synchronism with said vertical scanning signals, said signal generator means generating said incident angle control signals in such a manner that said incident angle of the electron beam varies during the blanking intervals of said vertical scanning signals.

4,680,470

METHOD AND APPARATUS FOR CRACK DETECTION AND CHARACTERIZATION

Jerry D. Heald, 7145 Via Colina, San Jose, Calif. 95139

Continuation-in-part of Ser. No. 565,384, Dec. 27, 1983. This application Aug. 17, 1984, Ser. No. 641,930

Int. Cl.⁴ G01T *1/169*

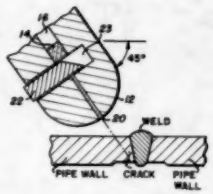
U.S. Cl. 250—358.1 **5 Claims**

1. A nondestructive examining method for detecting and characterizing anomalies in radioactively-contaminated structures comprising:

placing a gamma radiation detector in proximity to a surface of a structure to be examined, said detector including a radiation-proof housing with a beam slit therein for conducting gamma radiation from only a very small volume of material to said detector, said detector further including conversion means coupled thereto to convert said radiation to electrical signals;

scanning said surface while maintaining said detector in proximity to said surface;

measuring and recording said gamma radiation emitted by said structure at a plurality of points about said structure and at various angles relative to the surface, the measuring of gamma radiation including measuring at each point and angle the general background radiation and the radiation



due to the inside surface contamination and crack contamination and further measuring and recording a location of said housing relative to a predetermined starting point on said structure for each of said plurality of points wherein gamma radiation is measured, and pairing said measurement locations with said gamma radiation measurements, such that a plurality of data sets, comprising positional coordinates paired with radiation level values are generated; and

comparing the amount of radiation detected at each point and angle with the amount detected at each preceding point and angle along each scan direction, such that a graphical representation, including depth, of the anomaly may be developed at each scan location.

4,680,471

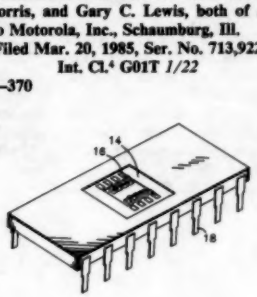
INTEGRATED CIRCUIT PACKAGING

Steven L. Morris, and Gary C. Lewis, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1985, Ser. No. 713,922

Int. Cl.⁴ G01T *1/22*

U.S. Cl. 250—370 **9 Claims**



1. A method for fabricating an integrated circuit comprising:

fabricating a semiconductor die having an integrated circuit formed therein:

assembling the die into a package of a packaging material, the radiation properties of which have been characterized as follows:

fabricating a means for detecting radiation using a semiconductor fabrication technique;

packaging the means for detecting radiation into said package of said packaging material using integrated circuit packaging techniques; and

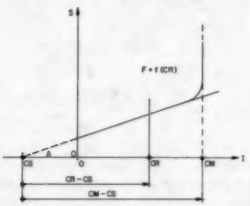
measuring the radiation emitted by said package of the packaging material by said means for detecting radiation within the package.

4,680,472

PROCESS AND APPARATUS FOR THE STABILIZATION OF MEASURING RESULTS FURNISHED BY AN "ELECTRON CAPTURE" DETECTOR WITH IDENTIFICATION OF ANOMALIES AFFECTING THE DETECTOR

Claude Mendes, Yerville, France, assignor to Giravions Dorand, Suresnes, France

Filed Jan. 14, 1986, Ser. No. 818,635
Claims priority, application France, Jan. 14, 1985, 85 00423
Int. Cl.[4] G01N *27/66*
U.S. Cl. 250—386 **8 Claims**



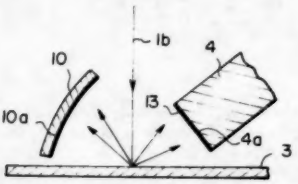
1. An electron capture detector for measuring the presence of an added component in a vector gas comprising means for applying a voltage to a measuring electrode source, means for varying said voltage in value or pulse frequency to maintain the current collected by said electrode equal to a constant reference current, and means for using the varying voltage as a measurement signal; said detector further comprising means to set said reference current according to a law of proportionality intermediate a maximum current and a spontaneous current at the ends of a useful linear curve section of a current curve determined by preliminary measurements carried on a pure vector gas.

4,680,473

RADIATION IMAGE READ-OUT APPARATUS INCLUDING SELECTIVE STIMULATING RAY REFLECTION PREVENTING MEANS

Terumi Matsuda; Toshitaka Aagano; Junji Miyahara; Nobuyoshi Nakajima, and Shigeru Saotome, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1985, Ser. No. 710,255
Claims priority, application Japan, Mar. 9, 1984, 59-45075; Nov. 28, 1984, 59-250704
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—484.1 **15 Claims**



1. A radiation image read-out apparatus including a scanning optical system for scanning a stimulable phosphor sheet carrying a radiation image stored therein by stimulating rays, a light guide member having a light input face positioned in the vicinity of a portion of said stimulable phosphor sheet scanned by said stimulating rays, said light guide member guiding light, which is emitted by said stimulable phosphor sheet in proportion to the stored radiation energy when said stimulable phosphor sheet is scanned by said stimulating rays, from said light input face, a light guiding mirror positioned outside said light guide member in the vicinity of said light input face and said portion of said stimulable phosphor sheet scanned by said stimulating rays, said light guiding mirror reflecting the light emitted by said scanned portion to said light input face, and a photoelectric converter for receiving the light guided by said light guide member and photoelectrically converting it into an electric signal,

wherein the improvement comprises

(i) a stimulating ray reflection preventing means positioned between said portion of said stimulable phosphor sheet scanned by said stimulating rays and said light guiding mirror, and

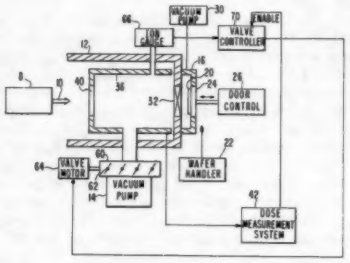
(ii) a means for preventing transmission of said stimulating rays and transmitting the light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy, said means positioned between said light guiding mirror and said photoelectric converter.

4,680,474

METHOD AND APPARATUS FOR IMPROVED ION DOSE ACCURACY

Norman L. Turner, Gloucester, and John D. Pollock, Rockport, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 22, 1985, Ser. No. 736,888
Int. Cl.[4] H01J *37/18*
U.S. Cl. 250—492.2 **8 Claims**



1. Ion implantation apparatus comprising:

a processing chamber;

means for evacuating the chamber to a baseline pressure;

means for introducing a workpiece into the chamber thereby causing an undesired increase in chamber pressure;

means for directing a beam of positively charged ions at the workpiece; and

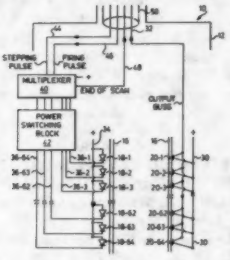
means for controlling the pressure in the chamber after introduction of the workpiece within a specified intermediate pressure range higher than said baseline pressure, thereby reducing pressure variations during implantation.

4,680,475

APPARATUS FOR DETECTING AN INTERFACE IN FLUIDS UTILIZING PLURAL MULTIPLEXED LIGHT EMITTERS AND RECEIVERS

John R. Tansony; Scott A. Langstaff, and Robert W. Tansony, all of Mississauga, Canada, assignors to Markland Specialty Engineering Ltd., Mississauga, Canada

Filed Jul. 31, 1985, Ser. No. 760,855
Int. Cl.[4] G01N *15/06, 21/00*
U.S. Cl. 250—577 28 Claims



1. A detector probe for immersion in a fluid, said probe comprising:

an axially elongated sheath;

transmitting means comprising a large plurality of axially spaced apart radiating devices contained within said sheath;

receiving means comprising a corresponding plurality of detecting devices contained within said sheath, each of which is transversely opposed to a radiating device and spaced therefrom by a gap defined by a continuous passage in said sheath into which said fluid may flow;

said sheath including continuously formed window means at least partially transparent to the radiation of said radiating devices sealing said sheath at opposed sides of said gap;

a pair of electrical busses entering said sheath;

first circuit means connecting one said buss in parallel relation to the devices of one of said transmitting means and said receiving means, and

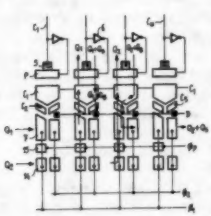
second circuit means including multiplexing means contained within said sheath for connecting the other said buss sequentially to the devices of the other of said transmitting means and said receiving means, so as to sequentially generate on the buss connected to said receiving means a value from each detecting device.

4,680,476

PHOTOSENSITIVE ROW TRANSFER DEVICE PROVIDED WITH NEGATIVE FEEDBACK AMPLIFIERS

Jean L. Berger, Grenoble; Louis Brissot, St. Egreve, and Yves Cazaux, Grenoble, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 30, 1985, Ser. No. 782,139
Claims priority, application France, Oct. 9, 1984, 84 15493
Int. Cl.[4] H04N *3/14*
U.S. Cl. 250—578 15 Claims



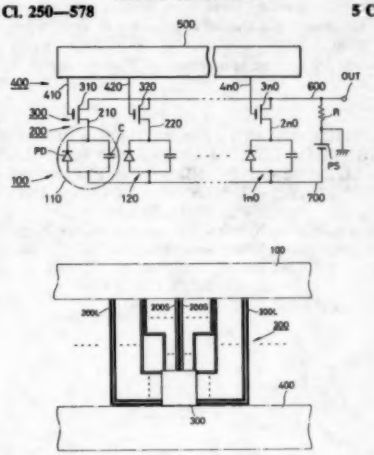
1. A photosensitive row transfer device having a photosensitive zone of M rows, each row having N photosensitive points, and a buried channel charge transfer row memory comprising N diodes adjacent respectively to N transfer gates, the N photosensitive points of each row being connected in parallel by N conductive columns to said N diodes, said row memory providing bulk transfer to a buried channel charge transfer read register of the signal charges of a same row, said photosensitive device having negative feedback amplifiers, each amplifier having a threshold voltage, and having an input connected both to a column and to a diode of the row memory and an output connected to an adjacent transfer gate, said device further comprising means for adjusting the threshold voltage of each amplifier, so that the operating point of the assembly constituted by each amplifier, an associated diode and an adjacent transfer gate to which said amplifier is connected, is located in the high gain portion of the transfer characteristic of the amplifier.

4,680,477

CONTACT TYPE DOCUMENT READING DEVICE WITH UNIFORM LINE-TO-LINE CONDUCTOR CAPACITANCE

Shigeru Sato, and Takashi Ozawa, both of Ebina, Japan, assignors to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 745,880
Claims priority, application Japan, Jun. 22, 1984, 59-128923
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—578 5 Claims



1. A document reading device of a charge storage type comprising a plurality of light receiving elements arranged on a substrate in a main scanning direction of a document, a plurality of driving means, each driving the corresponding one of said plurality of light receiving means and a plurality of conductor means for electrically connecting between said light receiving means and driving means respectively, wherein line-to-line capacitances of said plurality of conductor means are made substantially the same.

4,680,478

EFFICIENT FUEL UTILIZATION SYSTEM

Frank E. Wicks, 1 Nicholas Ave., Schenectady, N.Y. 12309

Filed Dec. 31, 1984, Ser. No. 687,813
Int. Cl.[4] F02G *5/02*
U.S. Cl. 290—2 8 Claims

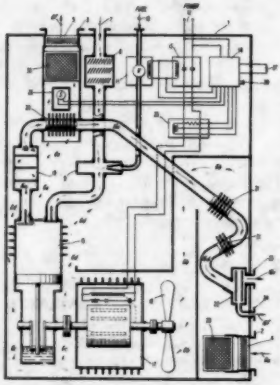
1. A forced hot air heating system, comprising:

an electric generator;

means for driving the electric generator;

an exhaust system engaged with said driving means for exhausing hot gasses from said driving means;

said exhaust system including a condensing heat exchanger arranged in a downward direction for cooling the hot



gasses below the condensing temperature of the water vapor in the hot gasses;

means for creating an air flow around the condensing heat exchanger and the driving means to extract heat therefrom; and

means for ducting said heated air flow for useful purposes.

4,680,479

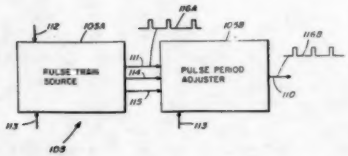
METHOD OF AND APPARATUS FOR PROVIDING PULSE TRAINS WHOSE FREQUENCY IS VARIABLE IN SMALL INCREMENTS AND WHOSE PERIOD, AT EACH FREQUENCY, IS SUBSTANTIALLY CONSTANT FROM PULSE TO PULSE

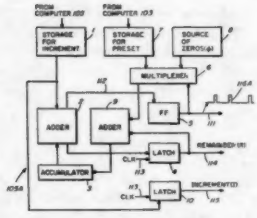
Sydney A. Alonso, Norwich, Vt., assignor to New England Digital Corporation, White River Junction, Vt.

Filed Jul. 29, 1985, Ser. No. 759,861

Int. Cl.[4] H03K *5/135, 3/64*

U.S. Cl. 307—265 **25 Claims**





1. Apparatus for generating successive electrical pulses whose period is predetermined to be substantially constant, that comprises:

means for generating a first train of electrical pulses, some of whose periods vary from the predetermined substantially constant period by an unacceptable amount;

means for noting the period between successive pulses of the first pulse train to determine when a next successive pulse in the first pulse train exceeds the predetermined substantially constant period by an unacceptable amount;

means for storing each pulse of the first pulse train to a permit time delay of the pulse; and

means for adjusting, when necessary, the output time of a pulse, in an output pulse train derived from the first pulse train, to correct for inexactness of the period thereof to provide an output pulse whose period is at an acceptably constant period with respect to the next previous pulse in the output pulse train, and hence, to provide an output pulse train in the form of successive pulses wherein the period between pulses is substantially constant.

4,680,480

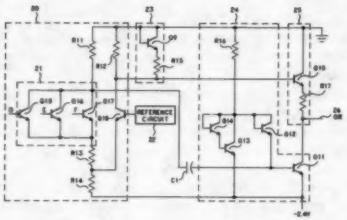
OUTPUT DRIVER CIRCUIT FOR LSI AND VLSI ECL CHIPS WITH AN ACTIVE PULLDOWN

Daniel F. Hopta, Bolton, Mass., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 31, 1984, Ser. No. 646,601

Int. Cl.[4] H03K *19/013, 19/003, 19/086, 17/04*

U.S. Cl. 307—270 **9 Claims**



1. In large scale integration (LSI) and very large scale integration (VSLI) emitter coupled logic (ECL) circuit chips, an output driver circuit for interfacing said circuit chips with external circuits that use logic levels different from said circuit chips, comprising:

a differential amplifier having a multiplicity of input signal lines and a plurality of output signal lines;

a bias circuit which establishes the switching level of said differential amplifier;

an emitter follower output circuit having an input line connected to a first output signal line of said differential amplifier;

an output level temperature compensation circuit connected to the input line of said emitter follower output circuit;

an active pulldown circuit connected to an output line of said emitter follower output circuit; and

a capacitor connected between a second output of said differential amplifier and said active pulldown circuit.

4,680,481

INTEGRATED JK-FLIPFLOP CIRCUIT INCLUDING HOT-ELECTRON TRANSISTORS

Doris Schmitt-Landsiedel, and Gerhard Dorda, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,922

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3330079

Int. Cl.[4] H03K *3/356*

U.S. Cl. 307—279 **13 Claims**

1. An integrated JK-flip-flop, comprising:

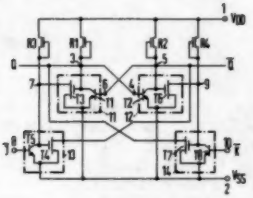
first and second cross-coupled inverters formed of respective first and second transistors and respective first and

second resistor elements connected in series with the respective first or second transistors;

a first circuit node between the first transistor and first resistor element being connected to a control terminal of the second transistor, and a second circuit node between the second transistor and second resistor element being connected to a control terminal of the first transistor;

said first circuit node being connected via a third inverter to a gate of a first field effect transistor which has its source-drain path connected between said second circuit node and a terminal at reference potential, and said second circuit node being connected via a fourth inverter to a gate of a second field effect transistor which has its source-drain path connected between said first circuit node and the reference terminal;

a gate of the first field effect transistor being connected to the reference terminal via a first control element whose control input represents a first input of the flip-flop, and a gate of the second field effect transistor being connected to the reference terminal via a second control element



whose control input represents a second input of the flip-flop;

the first and second transistors of the first and second cross-coupled inverters each comprising a hot electron transistor (HET) of a tunnel emission type having an emitter layer, insulator layer, base layer, and collector layer;

the third and fourth inverters comprising respective third and fourth field effect transistors;

each HET being combined with the respective third or fourth field effect transistor such that the HET emitter layer comprises an inversion layer in a channel region of the respective field effect transistor, the base layer of the HET being a first part of a gate electrode of the respective field effect transistor, an insulating layer between the HET base layer and a first part of said channel region, and the collector layer of the HET which has a portion over the HET base layer representing a remaining portion of the gate electrode of the respective field effect transistor and which covers a remaining second part of the channel region.

4,680,482

INVERTER FOR USE IN BINARY COUNTER

Takashi Obara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

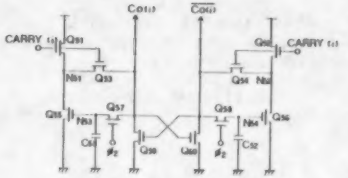
Filed Jul. 16, 1986, Ser. No. 886,156

Claims priority, application Japan, Jul. 16, 1985, 60-157414

Int. Cl.[4] H03K *3/356*

U.S. Cl. 307—279 **11 Claims**

1. An inverter for use in a binary counter comprising a flip-flop having first and second input/output nodes respectively applied with input signals of opposite polarities, first switch means connected between the first input/output node and a third node and turned on and off in response to a control clock signal, charge storage means connected to the third node so as to hold the potential on the first input/output node when the first switch means is turned on, and switch circuit means connected between a supply voltage and a ground and having a first input connected to the third node, a second input connected to receive an inversion control signal, and an output connected to the first input/output node, the switch circuit means being responsive to the inversion control signal so as to



bring its output to a voltage condition opposite to that held in the charge storage means.

4,680,483

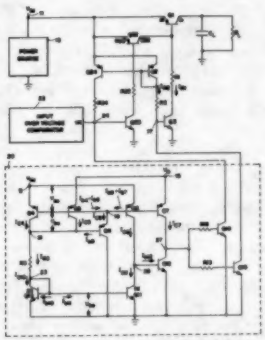
COMPARATOR CIRCUIT

Raymond L. Giordano, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed Feb. 28, 1986, Ser. No. 834,387

Int. Cl.[4] H03K *5/24, 17/16*

U.S. Cl. 307—355 **7 Claims**



1. The combination comprising:

first and second nodes for application thereto of a first and a second voltage, respectively;

first, second, and third transistors, each one of said first, second and third transistors having an input electrode and an output electrode defining the ends of a main conduction path and a control electrode;

means connecting the input electrode of said first transistor to said first node;

means connecting the input electrode of said second transistor to said second node;

means connecting the input electrode of said third transistor to one of said first and second nodes;

means connecting the control electrodes of said first, second and third transistors to a common biasing node;

means connecting the output electrodes of said first and second transistors in common at a first summing node for producing a first current into said first summing node which is the sum of the currents in said first and second transistors; and

current mirror means having an input connected to said first summing node and having an output connected to the output electrode of said third transistor at a second summing node for producing at said second summing node a current which is the difference between the current flowing in the output electrode of said third transistor and a

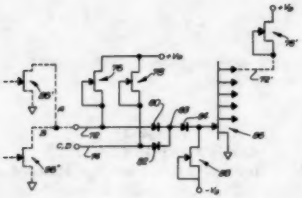
current proportional to said first current flowing in said output of said current mirror means.

4,680,484

WIRED-AND FET LOGIC GATE

Chris H. Saunders, Huntington Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 19, 1984, Ser. No. 663,004
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—448 **5 Claims**



1. A logic circuit comprising:

a plurality of wired-AND input circuits, each of which has a single pull-up field-effect transistor (FET) and a single input terminal connectable directly to a plurality of input signal lines to be logically ANDed together, the single input terminal being connectable to the plurality of input signal lines without any circuit elements being interposed between the input terminal and the plurality of input signal lines;

a FET output circuit having a common gate circuit and multiple independent drain output lines, which are connectable directly to input terminals of similar logic circuits, the multiple independent drain output lines being connectable to the input terminals of similar logic circuits without any circuit elements being interposed between the drain output lines and the input terminals; and

circuit means for logically ORing the plurality of wired-AND input circuits and applying the resultant signal to the gate circuit of the FET output circuit;

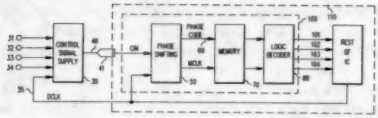
wherein the FET output circuit acts as a voltage pull-down circuit when one or more of the outputs is applied to the input terminals of similar logic circuits, thereby allowing the one or more outputs to be applied to the input terminals of the similar logic circuits without any circuit elements being interposed between the one or more outputs and the input terminals, thus providing a logic circuit with fewer parts, low power dissipation and small time delays.

4,680,485

QUAD-STATE CONTROL SIGNAL INPUT CIRCUIT

Marc K. Uhrey, Layton, Utah, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 19, 1985, Ser. No. 747,075
Int. Cl.[4] G11C *8/00;* **H03K** *17/56;* **G05F** *5/00;* **H03L** *7/00*
U.S. Cl. 307—463 **12 Claims**



1. A circuit for decoding a control signal which uses high, low and open states to alternately represent any one of four select signals, comprising:

the control signal input terminal for receiving a control signal;

a clock signal source;

four select output lines;

a phase-shifting circuit for producing a phase code signal which is phase shifted from the clock signal as a function of the control signal;

a memory connected to said phase-shifting circuit and having two bit stores which, in response to opposite and respective direction transitions in the clock signal, sample the phase code signal, and having respective output terminals for the sample values; and

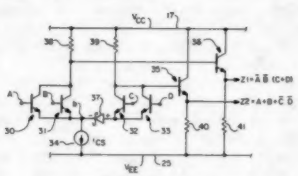
a logic decoder circuit connected to said memory and being responsive to the four possible combinations of memory samples to select a corresponding output line.

4,680,486

COMBINATIONAL LOGIC CIRCUITS IMPLEMENTED WITH INVERTER FUNCTION LOGIC

John E. Price, Palo Alto, and Larry W. De Clue, Saratoga, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Mar. 12, 1984, Ser. No. 588,919
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] H03K *19/092, 19/086, 17/60*
U.S. Cl. 307—475 **4 Claims**



1. A combinational logic circuit comprising:

at least two respective input lines respectively coupled for receiving respective input signals at conventional ECL levels;

a forward biased schottky diode;

a first input transistor including a base coupled to a respective first input line of said at least two input lines;

first resistor means connected between a collector of said first input transistor and a supply voltage, V_{CC};

second resistor means coupled to the supply voltage, V_{CC};

a first level shift bipolar transistor including an emitter connected through said forward biased Schottky diode to an emitter of said first input transistor, including a base coupled to a second input line of said at least two input lines, and including a collector coupled through said second resistor means to the V_{CC} supply voltage, said first level shift transistor producing respective level shifted signal representations of respective input signals received by said second input line; and

means to perform a combinational logic operation upon the respective input signals received by said first input line and upon the respective level shifted signal representations produced by said first level shift transistor in conjunction with said forward biased Schottky diode.

4,680,487

INPUT/OUTPUT PORT INCLUDING AUXILIARY LOW-POWER TRANSISTORS

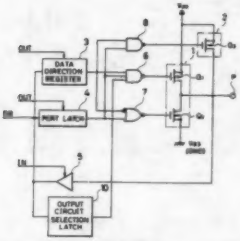
Mikio Kobayashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 898,033

Claims priority, application Japan, Aug. 19, 1985, 60-125758[U]

Int. Cl.⁴ H03K *17/687*

U.S. Cl. 307—475 **6 Claims**



1. An input/output port selectively having a data input mode and a data output mode, comprising:

a common input/output terminal for receiving or supplying data from or to an external device;

a pair of first and second transistors connected in series between a first voltage source and a second voltage source which is lower in voltage level than said first voltage source, a junction between said pair of first and second transistors being connected to said common input/output terminal;

a third transistor lower in power than said pair of first and second transistors and connected between said first voltage source and said common input/output terminal;

first control means for controlling said pair of first and second transistors such that said pair of first and second transistors are turned on and off in a complementary fashion in accordance with data to be output when said port is set in the data output mode; and

second control means for controlling said pair of first and second transistors and also said third transistor such that said pair of first and second transistors are maintained turned off and said third transistor is set either turned off or on when said port is set in the data input mode.

4,680,488

MOSFET-TYPE DRIVING CIRCUIT WITH CAPACITIVE BOOTSTRAPPING FOR DRIVING A LARGE CAPACITIVE LOAD AT HIGH SPEED

Koichiro Okumura, and Masayoshi Ohkawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

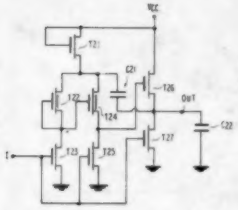
Filed Jun. 15, 1984, Ser. No. 621,313

Claims priority, application Japan, Jun. 15, 1983, 58-106990; Jul. 18, 1983, 58-130657

Int. Cl.⁴ H03K *17/10*

U.S. Cl. 307—482 **10 Claims**

1. A driving circuit comprising an impedance element having a first terminal connected to a first voltage terminal and a second terminal, said impedance element transferring electric charge at said first voltage terminal to said second terminal and transferring substantially no electric charge at said second terminal to said first voltage terminal thereby to allow said second terminal to assume a potential larger than the potential at said first voltage terminal, a first series circuit of first and second field effect transistors coupled between said second terminal of said impedance element and a second voltage terminal, a second series circuit of third and fourth field effect transistors coupled between said second terminal of said impedance element and said second voltage terminal, a third series circuit of fifth and sixth field effect transistors coupled between said first voltage terminal and said second voltage terminal, a capacitor means coupled between said second terminal of said impedance element and the intermediate junction of said third series circuit, means for supplying gates of said second, fourth and sixth transistors with an input signal, means for connecting a gate of said first transistor to the intermediate junction of said



first series circuit, means for connecting the intermediate junction of said first series circuit to a gate of said third transistor, and means for connecting the intermediate junction of said second series circuit to a gate of said fifth transistor, wherein the potential at said second terminal of said impedance element is raised above the potential at said first voltage terminal through said capacitor means in response to a rise in potential at said intermediate junction of said third series circuit.

4,680,489

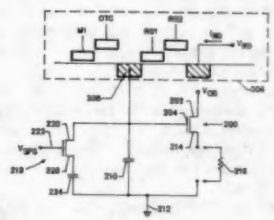
CONTROLLABLE PIECEWISE LINEAR GAIN CIRCUIT

Scott B. Stetson, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 25, 1986, Ser. No. 911,588

Int. Cl.⁴ H03G *3/32;* **H04N** *9/77, 3/14*

U.S. Cl. 307—493 **5 Claims**



1. A controllable, piecewise linear gain circuit, comprising:

a first field effect transistor, the drain of which is connected to a first source of bias voltage and the gate of which is connected to the input to the circuit;

a first capacitor connected between the gate of the first field effect transistor and a common ground;

a second field effect transistor, the drain of which is connected to the gate of the first field effect transistor and the gate of which is connected to a second source of bias voltage;

a second capacitor connected between the source of the second field effect transistor and the common ground;

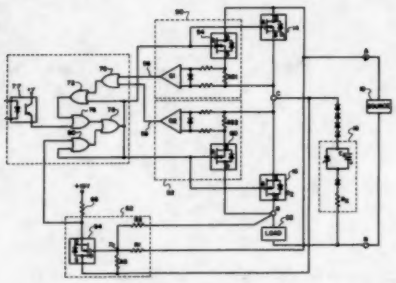
whereby the output voltage of the circuit may be measured across an output resistance connected between the common ground and the source of the first field effect transistor, such that the second field effect transistor will turn on and connect the second capacitor to the output of the circuit when a predetermined amount of charge has accumulated on the first capacitor, thereby reducing the gain of the circuit.

4,680,490

MOSFET AC SWITCH

Richard H. Baker, Bedford, and Edward L. Maddox, Lexington, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 2, 1985, Ser. No. 719,110
Int. Cl.[4] H03K *17/13, 5/153, 17/687*
U.S. Cl. 307—575 **12 Claims**



1. A solid state relay responsive to a control signal and for use with an impedance load and a source of alternating electrical power, said solid state relay comprising:

means for turning on said solid state relay operatively connected to the load and the source and responsive to said control signal having a first predetermined state and to a substantially zero voltage crossing of said alternating electrical power of said source, thereby connecting said load to said source, when said first predetermined state of said control signal and said zero voltage crossing occur at substantially the same point in time, said means for turning on having;

first switch means operatively connected in series with second switch means for connecting and disconnecting the load to the source, said first and second switch means in series with the load, said source operatively connected across said series connection of said first and second switch means and the load;

means for sensing voltage of the source and operatively connected across said first and second switch means and to a common node of said first and second switch means, said voltage sensing means outputting a voltage sensing signal when the source voltage substantially crosses zero;

means for controlling said first and second switch means, said controlling means receiving the control signal and said voltage sensing signal, said controlling means operatively connected to at least said first and second switch means for causing said first and second switch means to turn on or turn off; and

wherein said controlling means turns on said first and second switch means when said controlling means receives said voltage sensing signal indicating substantially zero voltage across said first and second switch means and when the control signal indicates turn on, said turning on of said first and second switch means causing the load to be connected to the source;

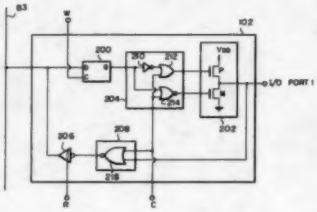
means for turning off said solid state relay operatively connected to the load and the source and responsive to said control signal having a second predetermined state different from said first predetermined state and to a substantially zero current crossing of said alternating electrical power of said source, thereby disconnecting said load from said source when said second predetermined state of said control signal and said zero current crossing occur at substantially the same point in time.

4,680,491

CMOS DATA INPUT-OUTPUT CIRCUIT

Hiroshi Yokouchi, and Kazuhiko Miyazaki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 29, 1985, Ser. No. 739,304
Claims priority, application Japan, May 30, 1984, 59-108475
Int. Cl.[4] H03K *17/56, 19/096, 19/00*
U.S. Cl. 307—579 **6 Claims**



1. A CMOS data input-output circuit for controlling a bidirectional transmission of information between a data bus and an I/O port comprising:

a memory means connected to a bit line of said data bus for temporarily receiving information on said bit line of said data bus in response to a write signal;

a CMOS output buffer means including a P-MOS transistor and an N-MOS transistor which are serially connected, said P-MOS transistor having a gate and having a source connected to a power source and having a drain connected to said I/O port, said N-MOS transistor having a gate and having a source connected to a ground and having a drain connected to said I/O port;

an output control means having an output connected to the output of said memory means, and having a first output connected to said gate of said P-MOS transistor of said CMOS output buffer means and a second output connected to said gate of said N-MOS transistor of said CMOS output buffer means, and for placing said I/O port in an electrically floating condition when a control signal is input thereto;

an input buffer means having an input and having an output connected to said bit line of said data bus for selectively transmitting information on said I/O port to said bit line of said data bus in response to a read signal input thereto; and

an input control means having an output connected to said input of said input buffer means, a first input connected to said I/O port and a second input for receiving said control signal; wherein an output of said input control means is fixed at a predetermined logic level when said control signal is inputted to said second input of said input control means during a power-down operation.

4,680,492

AUDIO-FREQUENCY ELECTROMECHANICAL VIBRATOR

Yasuji Tamura, Ojima, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Sep. 11, 1985, Ser. No. 775,011
Claims priority, application Japan, Sep. 11, 1984, 59-188901
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—15 **5 Claims**

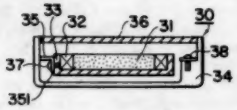
1. An audio frequency electromechanical vibrator comprising:

a flat plate shaped permanent magnet which is magnetized in a predetermined direction;

a coil wound around said permanent magnet in a direction different than said predetermined direction;

a yoke in which said permanent magnet and said coil are disposed;

a case element for elastically supporting said yoke, said case element being magnetically attractive to said yoke; and



means for applying an alternating current to said coil for causing said magnetic force to change thereby causing a vibratory displacement of said yoke with respect to said case element.

4,680,493

VENTILATING DEVICE FOR A GENERATOR

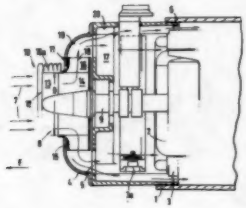
Gerhard Ziegler, Besigheim; Karl Gregotsch, Flacht, and Rudolf Herrmann, Flein, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 747,570

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423319

Int. Cl.[4] H02K *9/06*

U.S. Cl. 310—62 **3 Claims**



1. A ventilating arrangement for a motor vehicle generator of the type having a rotor-stator unit arranged in a housing provided with air guiding ducts, said ventilating arrangement comprising:

the housing having air guiding ducts;

a radial directing fan wheel held on a shaft of the rotor upstream of the rotor-stator unit having an inlet diameter;

a drive pulley formed as an air delivery wheel on the shaft, said air delivery wheel comprising supporting ribs forming radial guide blades, which act as a precompressing fan, said precompressing fan having an outlet area approximately equal to the inlet diameter of the fan wheel,

a front side cover means surrounding at least the downstream side of the fan wheel and held to the housing with a running gap between the cover and housing;

the side cover means forming a curved inside air guiding surface entering into a cylindrical housing surface of the housing; said air-guiding surface being disposed opposite and spaced from the air current radially emerging from the fan wheel;

the cover means in the housing closing off a front side high-pressure space which downstream has a larger cross-section than in the area of a radial air outlet of the fan wheel; and

wherein the cover means directs air flow axially through a plurality of flow paths in the motor vehicle generator.

4,680,494

MULTIPHASE MOTOR WITH FACIALLY MAGNETIZED ROTOR HAVING N/2 PAIRS OF POLES PER FACE

Michel Grosjean, 1, rue des Narcisses, CH-2504 Bienne, Switzerland

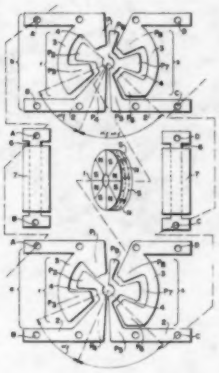
PCT No. PCT/CH84/00119, § 371 Date Mar. 28, 1985, § 102(e) Date Mar. 28, 1985, PCT Pub. No. WO85/00705, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 30, 1984, Ser. No. 720,409

Claims priority, application Switzerland, Jul. 28, 1983, 4128/83

Int. Cl.[4] H02H *37/00*

U.S. Cl. 310—156 **15 Claims**



1. A multiphase motor comprising:

a rotor having first and second faces, each face having N/2 pairs of magnetic rotor poles distributed around the axis of rotation of said rotor, adjacent rotor poles on each face having opposite polarities, the rotor poles on the first face being directly opposite the rotor poles of the same polarity on the second face, where: N=2 mn, n being a positive integer, and m being a positive integer greater than 1;

a stator, surrounding said rotor, and having stator poles concentric to said rotor, said stator formed with m phases, each phase comprising a first and second pair of polar pieces, each pair of polar pieces comprising an internal and an external polar piece being substantially coplanar and being interpositioned one within the other and separated by a sinuous air gap, said first pair of polar pieces of each phase being substantially identical to said second pair of polar pieces and being located on opposite sides of said rotor, wherein for all polar pieces of m−1 phases, as well as for a first polar piece of each of said first and second pair of polar pieces of the remaining phase, the stator poles are full and are spaced apart by an angular interval at least approximately as large as that between adjacent rotor poles, wherein (N/2m)−1 stator poles of a second polar piece of each of said first and second pair of polar pieces of said remaining phase are full, and wherein the m remaining stator poles of said second polar piece are fractional, the sum of the angular arcs of all fractional stator poles being approximately equal to the angular arc of a full stator pole; and

a core for each phase, said internal polar pieces of each phase being magnetically connected to a first end of a respective core, and said external polar pieces of each phase being magnetically connected to a second end of said respective core;

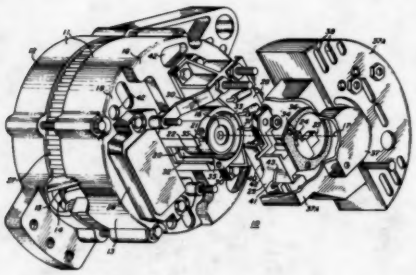
wherein each core has at least one coil wound thereon, and wherein each phase in phase shifted from all other phases.

4,680,495

SPARK PROTECTED ALTERNATOR

George E. Chiampas, Chicago; John P. Finnegan, West Chicago, both of Ill., and Henry Villegas, Buffalo, N.Y., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 15, 1986, Ser. No. 863,665
Int. Cl.[4] H02K 5/136, 5/14
U.S. Cl. 310—220 10 Claims



1. An alternator/electric machine comprising:

a housing for effectively encasing at least a rotor within an internal cavity formed by said housing;

a shaft rotatable about an axis, said rotor mounted to said shaft within said housing, said shaft rotatably passing through a fixed end plate of said housing and having an extension of said shaft from said end plate being external to said internal cavity;

commutating (slip) rings connected to said rotor and mounted on said shaft extension;

brush assembly means comprising an insulating brush holder fixed to said housing and having metal brushes attached to the brush holder which mate with said commutating rings;

said end plate having integral extensions thereof which form side walls of an external cavity external to said internal cavity, said side walls partially radially, with respect to said axis, surrounding said shaft extension and commutating rings, said external cavity having one axial end effectively closed by said end plate and an open axial end;

one of said brush holder and said side walls having projections therein which mate with slots in the other one of said brush holder and said side walls to radially close said external cavity with said brush holder, a portion of said brush holder positioned radially external to said external cavity and providing electrical access to said brushes; and

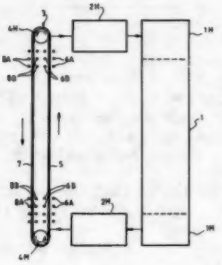
end cap means fixed to said housing to effectively close said open axial end of said external cavity with respect to ambient atmosphere surrounding said housing, wherein said end plate and end cap means, together with said brush holder and side walls, effectively isolate said external cavity from ambient atmosphere surrounding the housing, and wherein said projections and slots provide a fixed labyrinth seal for effectively isolating said external cavity from ambient atmosphere surrounding the housing.

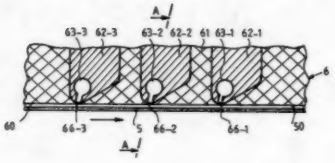
4,680,496

APPARATUS FOR CONVEYING ELECTROSTATIC CHARGES, IN PARTICULAR FOR VERY HIGH VOLTAGE ELECTROSTATIC GENERATORS

Michel Letournel, Strasbourg Cronenbourg; Jean-Marie Helleboid, Mundolsheim, and Claude Teissier, Lingolsheim, all of France, assignors to Centre National de la Recherche Scintifique, France

Filed Jul. 29, 1986, Ser. No. 891,681
Claims priority, application France, Jul. 31, 1985, 85 11731
Int. Cl.[4] H02N 1/00
U.S. Cl. 310—308 14 Claims





1. In or for apparatus for conveying electrostatic charges within an ambient gas atmosphere, in particular for very high voltage electrostatic generators, of the type comprising :

(a) a flat insulating belt (3) movable in a closed cycle between an earthed or low voltage zone (1M) and a very high voltage zone (1H), the zones being spaced apart from one another, sections of the belt moving towards or away from a respective zone;

(b) means (2M) for depositing electric charges on the belt in the earthed zone;

(c) means (2H) for extracting electric charges from the belt in the high voltage zone; and

(d) two structures (6,8) respectively placed close to each belt section between the two zones for the purpose of controlling the electric field along the belt between the said zones,

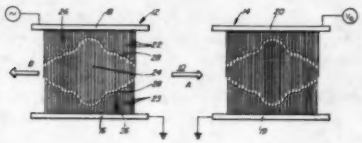
the improvement wherein each of these structures (6, 16, 26) extends continuously along a length of the respective belt section (5), each structure being of insulating or non-conductive material in the direction of movement of the belt, and wherein each structure comprises, on its side facing the belt, a flat surface (60, 160, 260) designed to produce a cushion (50) of ambient gas between itself and the belt.

4,680,497

SURFACE ACOUSTIC WAVE DEVICES

Grantley O. Este, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 28, 1986, Ser. No. 856,553
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 C 6 Claims



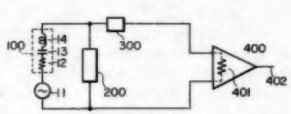
1. A surface acoustic wave (SAW) device having an interdigitated transducer (IDT) comprising first and second voltage rails, first and second pluralities of parallel conducting electrodes extending inwardly from respective voltage rails, said rails and said electrodes formed on a piezoelectric substrate, electrodes of said first plurality being interleaved with electrodes of said second plurality to establish an interleaved or apodized area adjacent to a non-interleaved area, said apodized area varying in width along the IDT, the electrodes in the non-interleaved areas being electrically linked by a linking conductor extending close to a boundary between the apodized area and the non-interleaved area.

4,680,498

INPUT CIRCUIT IN ULTRASONIC APPARATUS

Wasao Takasugi, Higashiyamato; Ryuichi Shinomura, Hachioji, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,602
Claims priority, application Japan, Feb. 8, 1985, 60-21763
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—319 6 Claims



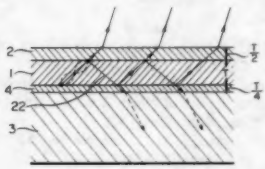
1. An input circuit in an ultrasonic apparatus comprising:
a piezoelectric transducer having a predetemined inter-electrode capacitance;
a reception amplifier for amplifying an output electric signal from said piezoelectric transducer;
means electrically connecting said piezoelectric transducer to said reception amplifier and having a predetermined equivalent capacitance; and
said reception amplifier having an input impedance which is lower than a parallel impedance composed of said inter-electrode capacitance and said equivalent capacitance at a frequency of said output electric signal, said reception amplifier including a current mirror type amplifier electrically connected to said piezoelectric transducer and an output amplifier for amplifying an output of said current mirror type amplifier.

4,680,499

PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH ACOUSTIC MATCHING PLATE

Shin'ichiro Umemura, Hachioji; Hiroshi Takeuchi, Matsudo; Kageyoshi Katakura, and Chitose Nakaya, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,833
Claims priority, application Japan, Apr. 10, 1985, 60-74289; Aug. 30, 1985, 60-189662
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—334 5 Claims



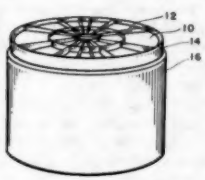
1. An ultrasonic transducer comprising:
a piezoelectric plate having both surfaces thereof metallized and at least one of the surfaces having a plurality of isolated metallized areas;
a backing material formed on the back surface of said piezoelectric plate; and
an acoustic matching plate formed on the front surface of said piezoelectric plate, having a longitudinal wave velocity within ±25% of a longitudinal wave velocity of said piezoelectric plate and having a thickness equal to one half of a thickness of said piezoelectric plate.

4,680,500

INTEGRAL GRID/CATHODE FOR VACUUM TUBES

Erik S. Buck, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 6, 1986, Ser. No. 836,876
Int. Cl.[4] H01J *1/46, 1/52, 17/04, 17/12, 19/38*
U.S. Cl. 313—348 9 Claims



1. The method of forming an integrated grid-cathode structure comprising the steps of:
forming a plug in the form of a honeycomb structure having parallel open cells, using a strong, insulating material which resists wetting by barium at barium vapor temperatures, with one end being designated the grid end for a control grid;
placing said plug in a fixture which is a receptacle for said grid end of the plug;
filling the open cells in the honeycomb structure of the plug with cathode material which include barium compounds, to thereby form a cathode matrix;
removing the plug from the fixture; and
at some time following formation of the plug, forming a

control grid by coating said grid end of the plug with conductive material.

6. An integrated grid-cathode structure comprising:

a plug in the form of a honeycomb structure having parallel open cells, of a strong, insulating material which resists wetting by barium at barium vapor temperatures;

a control grid comprising a conductive coating on one end of said plug; and

a cathode matrix of a material which includes barium compounds, formed in the open cells of the honeycomb structure of the plug, the cathode matrix being recessed to provide a given spacing of the control grid from the cathode.

4,680,501

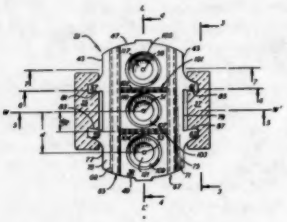
STRENGTHENING MEANS FOR A CRT IN-LINE ELECTRODE COMPONENT

Floyd K. Collins, Seneca Falls, and George E. Hassler, Auburn, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,819

Int. Cl.[4] H01J *29/82*

U.S. Cl. 313—456 **8 Claims**



1. Improved strengthening means for a substantially planar one-piece electrode component in a plural electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support members, said electrode component evidencing alpha and beta surfaces and having opposed side and end regions with defining L—L′ and W—W′ axes thereacross; said component having a center and two side-related spatially positioned apertures therethrough located in an in-line relationship substantially coinciding with said L—L′ axis, the center aperture being located at the intersection of said L and W axes, with said side-related apertures oriented equidistantly therefrom along said L—L′ axis on either side of said W—W′ axis; said strengthening means comprising:

at least one longitudinal channel located in each of the side regions of said component in parallel relationship with said L—L′ axis, each of said channels being indented inward from said beta surface of said component for the full length of said region to form a longitudinal rib projecting from said alpha surface, each of said channels being an open-ended trough formation having width and depth dimensions formed by three adjoining longitudinal surfaces defining an outer wall portion, an inner wall portion and a bottom portion therebetween, each of said channels displaced inwardly from either side of said component to form ledges in the beta surface between the channels and the side edges of the component, the ledge edges being substantially parallel with said L—L′ axis and extending along the full length of said side region; each of the channel-related ledges having an outstanding dimension at least substantially equal to the thickness of the component material and supporting projections extending from either side of said component; the supporting projections being integral planar extensions of said ledge formations.

4,680,502

INDEX TYPE COLOR PICTURE TUBE

Naomitsu Watanabe, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,784

Claims priority, application Japan, Jun. 29, 1984, 59-133103

Int. Cl.[4] H01J *29/20*; C09K *11/08*

U.S. Cl. 313—468 **6 Claims**

1. An index type color picture tube having a stripe type fluorescent screen with stripes of a zinc sulfide-based green color phosphor, a zinc sulfide-based blue color phosphor, a red color phosphor, and a phosphor for index detection, which comprises the red color phosphor being a mixture of a Y_2O_2S-:Eu phosphor containing not more than 2 ppm of Tb and a Y_2O_3:Eu phosphor, or a Y_2O_2S:Eu phosphor containing 5 to 30 ppm of Tb.

4,680,503

GLASS COMPOSITION SUITABLE FOR USE IN A FLUORESCENT LAMP AND IN A CATHODE-RAY TUBE, FLUORESCENT LAMP AND CATHODE-RAY TUBE MANUFACTURED USING THIS GLASS COMPOSITION

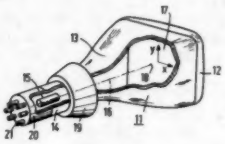
Gijsbertus A. C. M. Spierings; Denise M. Krol, and Gary E. Thomas, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 8, 1985, Ser. No. 785,421

Claims priority, application Netherlands, Oct. 10, 1984, 8403076

Int. Cl.[4] H01J *31/00*; C03C *3/108, 3/105, 3/072*

U.S. Cl. 313—480 **2 Claims**



1. A fluorescent lamp comprising a hermetically sealed glass lamp envelope, in which two electrodes connected to current supply wires are provided, between which electrodes a discharge takes place during operation of the lamp, the lamp envelope being filled with a gas atmosphere and a metal which evaporates at least partially during operation of the lamp, characterized in that the lamp envelope is manufactured from a glass composition which consists essentially of silicon dioxide, aluminium oxide, boron oxide, barium oxide, and lead oxide, characterized in that the glass composition consists essentially of the following components in the specified quantities in % by weight:

SiO_2	30–55	ZrO_2	0–10
Al_2O_3	5–20	CaO	0–8
B_2O_3	4–18	MgO	0–3
BaO	10–25	SrO	0–5
PbO	10–30		

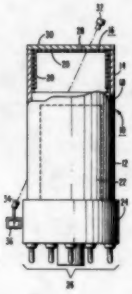
in which the total amount of CaO, MgO and SrO is less than 10% by weight and in which the glass composition, apart from small amounts of impurities, is free from alkali metal oxides.

4,680,504

ELECTRON DISCHARGE DEVICE HAVING A NARROW RANGE SPECTRAL RESPONSE

Fred A. Helvy, Manheim Township, Lancaster County, and Arthur F. McDonie, East Hempfield Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 11, 1985, Ser. No. 786,530
Int. Cl.[4] H01J *40/02, 43/28*
U.S. Cl. 313—524 2 Claims



1. In an electron discharge device having an envelope including a sidewall and an input faceplate, and a photoemissive cathode within said envelope for providing photoelectrons in response to radiation incident thereon, the improvement comprising

said input faceplate being an ultraviolet transmitting filter which transmits radiation predominantly in the ultraviolet portion of the electromagnetic spectrum but transmits essentially no radiation in the visible portion of the electromagnetic spectrum, and

said photoemissive cathode having an intrinsic responsivity extending from the near-ultraviolet portion through the visible portion of the electromagnetic spectrum, the combination of said filter faceplate and said photoemissive cathode limiting said device to a responsivity within the wavelength range of about 300 to less than 400 nanometers.

4,680,505

SMALL SIZE DISCHARGE LAMP HAVING SUFFICIENT ARC LENGTH AND HIGH LUMINOUS EFFICIENCY

Fumiaki Funada; Hiroshi Hamada, both of Yamatokoriyama, and Osamu Inoue, Himeji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Ushio Denki Kabushiki Kaisha, Tokyo, both of, Japan

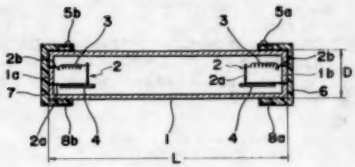
Filed Oct. 17, 1985, Ser. No. 788,455
Claims priority, application Japan, Oct. 17, 1984, 59-155858[U]; Nov. 15, 1984, 59-239543; Aug. 6, 1985, 60-119862[U]
Int. Cl.[4] H01J *61/06, 61/26, 61/30*
U.S. Cl. 313—558 12 Claims

1. A discharge lamp comprising:

a glass tube having first and second ends, with an outer diameter thereof being smaller than 5 millimeters and a length thereof being shorter than 300 millimeters;

a first electrode means provided at said first end, said first electrode means comprising an elongated filament provided inside said glass tube and extending parallel to an axial direction of said glass tube, said filament being connected to a first lead wire at a first end of the filament and a second lead wire at a second end of the filament;

a second electrode means provided at said second end; and



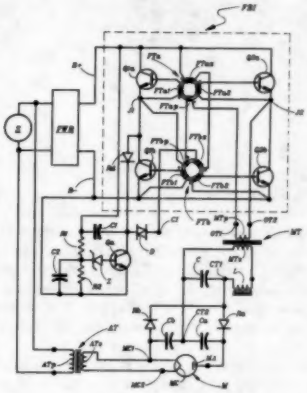
an elongated getter located inside said glass tube, said elongated getter being adjacent and parallel to said elongated filament.

4,680,506

INVERTER-TYPE MICROWAVE OVEN POWER SUPPLY

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Dec. 10, 1984, Ser. No. 679,929
Int. Cl.[4] H05B *39/00, 41/14*
U.S. Cl. 315—102 9 Claims



1. A power supply for a magnetron in a microwave oven, said magnetron having an anode and a cathode, said cathode having to be incandescent in order for the magnetron to effectively conduct anode current, said power supply comprising:

rectifier means connected with an AC source and operable to provide periodic relatively low-magnitude low-frequency DC voltage pulses;

inverter means powered by these DC voltage pulses and operable, but only when receiving an actuating input of trigger pulses synchronized with the DC voltage pulses, to provide at an inverter ouput intermittent periodic bursts of relatively low-magnitude high-frequency squarewave voltage, said squarewave voltage being of frequency substantially higher than that of said DC voltage pulses;

transformer connected with said inverter ouput and operative to provide at a secondary output voltage-magnified transformations of said intermittent periodic bursts of relatively high-magnitude high-frequency squarewave voltage;

a series-combination of an inductor and a capacitor connected across this secondary output, said series-combination being resonant at or near the frequency of said squarewave voltage and operative to provide at a tertiary output

intermittent periodic bursts of relatively high-magnitude high-frequency sinusoidal voltage;

rectifier and filter means connected with said tertiary output and operative to rectify and filter said bursts of high-magnitude high-frequency voltage, and to provide to the magnetron intermittent periodic low-frequency anode current pulses;

conditioning means operative to provide heating power to said cathode, thereby to make it incandescent; and

actuating means operative to provide said actuating input, but only after said conditioning means has provided said heating power for at least a minimum period of time.

4,680,507

LIQUID METAL ION SOURCE

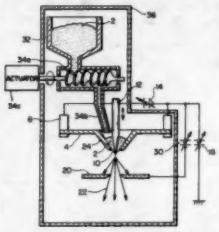
Kaoru Uemura, Kokubunji; Tohru Ishitani, Sayamashi, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,796

Claims priority, application Japan, Nov. 11, 1983, 58-210854

Int. Cl.⁴ H01J *7/24*

U.S. Cl. 315—111.81 **7 Claims**



1. A liquid metal ion source comprising a reservoir which holds a source material to-be-ionized in a melted state; an emitter which emits from its tip, ions of the melted source material fed from said reservoir; an extracting electrode which applies a high electric field to the tip of said emitter, thereby to extract the ions from said tip of said emitter; tank means for storing the source material which is a particulate material, said tank means having a storage capacity for the particulate source material which is larger than the storage capacity of said reservoir; transfer means for transferring said particulate source material from said tank means to said reservoir, said transfer means being spatially separated from said reservoir so as to inhibit heat transfer from said reservoir to said tank means; and a vacuum chamber for enclosing said reservoir, said emitter, said extracting electrode, said tank means and said transfer means, said vacuum chamber maintaining said reservoir, said emitter, said extracting electrode, said tank means and said transfer means in a vacuum state; whereby said liquid metal ion source is operable for a long time period with a stable ion emission characteristic and reduced power consumption by inhibiting heat transfer.

4,680,508

LOAD CONTROL CIRCUIT

William M. Rucki, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1986, Ser. No. 861,675

Int. Cl.⁴ H05B *37/00*

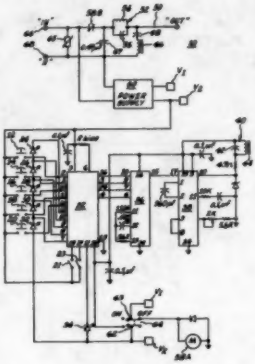
U.S. Cl. 315—166 **15 Claims**

1. A control circuit for controlling the electrical power supplied by an a-c power supply line at a first predetermined frequency; said control circuit comprising:

electronic data storage means connected electrically in series in said power line for controlling the supplying of electrical power downstream at least one electrical load;

electronic data storage means for storing a plurality of predetermined load control data;

manually operable means for selecting one of said plurality of predetermined load control data for application of said power supply line;



control signal encoding means for converting said one of a plurality of load control data to a data signal; and

transmitter means for transmitting said data signal at a second predetermined frequency substantially different from said first predetermined frequency to said power supply line.

4,680,509

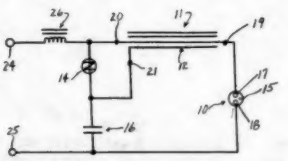
METHOD AND APPARATUS FOR STARTING HIGH INTENSITY DISCHARGE LAMPS

Charles N. Fallier, Jr., Westford, and James N. Lester, Rockport, both of Mass., assignors to GTE Laboratories, Inc., Waltham and GTE Products Corporation, Danvers, both of, Mass.

Filed Dec. 23, 1985, Ser. No. 812,577

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—290 **21 Claims**



1. Apparatus for starting a high pressure discharge lamp of the type including a discharge tube having a pair of electrodes sealed therein and enclosing a fill material which emits light during discharge, said apparatus comprising:

a spiral line pulse generator including two conductors and two insulators, each in the form of an elongated sheet, in an alternating and overlapping arrangement which is rolled together in a spiral configuration having a plurality of turns for forming an electromagnetic wave transmission line during operation;

a ferromagnetic core means disposed in relation to said spiral configuration for increasing the distributed inductance of said spiral line generator, and thereby increasing the electromagnetic wave transit time in the transmission line formed by the spiral line generator;

said spiral line pulse generator including an output terminal

coupled to one of said lamp electrodes and a pair of input terminals, one of said input terminals and another of the lamp electrodes being adapted for coupling to a source of AC lamp operating power;

a switch means coupled across said input terminals, and thus between the conductors of the spiral line generator for periodically short-circuiting said conductors during operation;

and pulse circuit return means coupled from the other of the input terminals of said spiral line generator to said last mentioned lamp electrode;

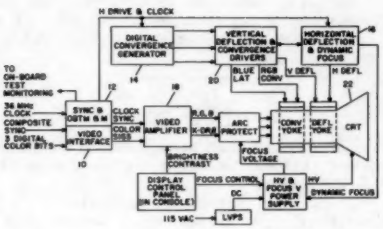
whereby said spiral line generator, upon application of a source of AC lamp operating power and periodic operation of said switch means, provides at said pulse output, high voltage, short duration pulses of sufficient energy to initiate discharge in said high pressue discharge lamp.

4,680,510

COLOR MONITOR WITH IMPROVED SYNCHRONIZATION

Robert H. Spieth, Ronkonkoma; Chuen W. Louie, Richmond Hill; John L. Volk, Eatons Neck; Darrell D. Roelofs, Huntington Station; Anthony N. DeLorenzo, Ft. Salonga, all of N.Y.; Arthur L. Romeo, Los Angeles, Calif., and Thomas L. Mayer, Greenlawn, N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,925
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—368 **7 Claims**



1. A color video monitor having a high resolution display, comprising:

first means for amplifying an input video signal;

second means for producing color convergence signals;

third means connected to receive said color convergence signals from said second means for providing a vertical deflection signal and color convergence driver signals for said color video monitor;

fourth means connected to the third means for providing a horizontal deflection signal and a dynamic focus signal for said color video monitor;

a cathode ray tube;

means coupled to said cathode ray tube for receiving said color convergence driver signals, said vertical deflection signal and said horizontal deflection signal for controlling the display on said cathode ray tube; and

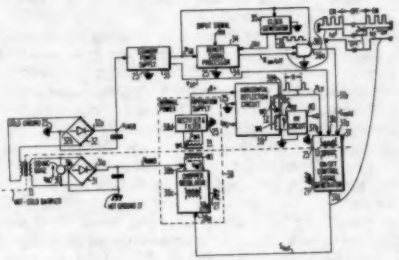
fifth means synchronizing said second, third and fourth means to an external clock and its associated video input signal including horizontal synchronization pulses and vertical synchronization pulses, said color convergence signals, said vertical deflection signals and said horizontal deflection signals each being synchronized to said external clock.

4,680,511

VIDEO APPARATUS FOR GENERATING A CONDUCTIVELY ISOLATED CONTROL SIGNAL

William V. Fitzgerald; Ronald E. Fernsler, and Kevin E. Nortrup, all of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,689
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—411 **20 Claims**



1. A power supply apparatus, comprising:

a source of a first on-off control signal having an on-state and an off-state for providing normal operation on-off control;

means responsive to said first on-off control signal for generating a first AC signal of constant frequency and width during one of said on or off-states and not during the other of said on or off-states;

a signal transformer having a first winding coupled to said first AC signal for developing in a second winding thereof a second AC signal of constant frequency and width during said one on or off state and not during said other on or off state;

a source of input supply voltage; and

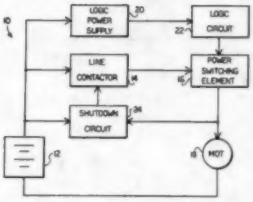
a power supply coupled to said source of input supply voltage and to said second winding of said signal transformer for developing an operating voltage only during the on-state of said first on-off control signal.

4,680,512

FAULT PROTECTION APPARATUS FOR TRACTION MOTOR CIRCUIT

Grant C. Melocik, Chardon, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed May 19, 1986, Ser. No. 864,237
Int. Cl.[4] H02H *7/08*
U.S. Cl. 318—139 **2 Claims**



1. Apparatus for controllably disabling a electrical motor circuit in response to detecting a predetermined condition of a pulse modulated power switching element, said electrical motor circuit including an electrical motor serially connected to a power supply through said power switching element, comprising:

logic means for controllably operating said electrical motor in response to predetermined command signals;

a logic power supply connected between said motor power supply and said logic means and adapted to deliver conditioned electrical power to said logic means;

timing means for monitoring the electrical conduction of said ower switching element and producing a fault signal in resonse to said power switching element continuing to conduct for longer than a predetermined continuous period of time;

latch means for receiving said fault signal and responsively producing a blocking signal;

interrupt means for receiving said blocking signal and responsively controllably blocking power from said motor power supply to said electrical motor, said interrupt means including a line switch having switchable power terminals serially connected between said motor power supply and said electrical motor; and

wherein each of said timing, latch, and interrupt means is adapted to operate directly from said motor power supply independent of said logic power supply and said logic means.

2. Apparatus for controllably disabling an electrical motor circuit in response to detecting a predetermined condition of a pulse modulated power switching element, said electrical motor circuit including an electrical motor serially connected to a motor power supply through said power switching element, comprising:

logic means for controllably operating said electrical motor at a speed and direction responsive to predetermined command signals;

a logic power supply connected between said motor power supply and said logic means and adapted to deliver conditioned constant voltage electrical power to said logic means;

a timing circuit having a R/C timing element and being connected to said power switching element;

a semiconductor switch having a first input terminal connected to said timing circuit and a second input terminal connected to said motor power supply;

a line switch having a control element connected to said semiconductor switch and having switchable power terminals serially connected between said motor power supply and said electrical motor; and

each of said timing circuit and said semiconductor switch being free from connection to said logic power supply.

4,680,513

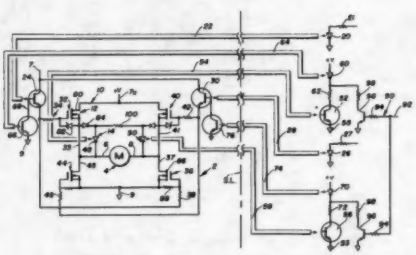
ELECTRIC MOTOR REVERSING CONTROL DEVICES

Gregory C. Kennedy, Port St. Lucie, Fla., assignor to Harbor Branch Oceanographic Institute Inc., Ft. Pierce, Fla.

Filed Aug. 11, 1986, Ser. No. 895,670

Int. Cl.[4] H02P 1/22

U.S. Cl. 318—285 **6 Claims**



1. A control device for a reversible D.C. electric motor having first and second armature leads comprising:

input switch means for reversing the flow of current through said armature leads for reversing the direction of rotation of said motor,

first control means for preventing flow of current through said armature leads initially upon current reversing by said input switch means including:

detector means for determining the voltage drop existing across said first and second armature leads, and

automatic switch means for blocking flow of current from said input switch means to said armature leads until said voltage drop is determined by said detector means to be in a predetermined range and allowing flow of said current while said voltage drop is determined to be within said range, and

second control means for periodically interrupting said flow of current while said motor gains rotational speed after being reversed in relation to the magnitude of said flow of current.

6. A control device for a reversible D.C. electric motor having first and second armature leads comprising:

input switch means for reversing the flow of current through said armature leads for reversing the direction of rotation of said motor including:

a first light emitter which is activated for clockwise rotation of said motor optically connected to a first photo-detector, and

a second light emitter which is activated for counter-clockwise rotation of said motor optically connected to a second photo-detector, and

control means for preventing flow of current through said armature leads initially upon current reversing by said input switch means including:

detector means for determining the voltage drop existing across said first and second armature leads, and

automatic switch means for blocking flow of current from said input switch means to said armature leads until said voltage drop is determined by said detector means to be in a predetermined range and allowing flow of said current while said voltage drop is determined to be within said range.

4,680,514

MOTOR

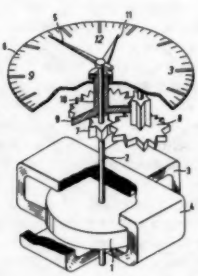
Roland Sudler, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,437

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419100

Int. Cl.[4] H02K 59/02

U.S. Cl. 318—318 **13 Claims**



1. In an electric drive, particularly for driving a clockwork, having a rotatably supported rotor which has diametrically opposite permanent-magnet poles, with a multi-phase coil arrangement having at least one coil for the production of a magnetic field which deflects the rotor from its instantaneous

position as a function of control signals on said coil of the coil arrangement, the improvement wherein

said drive further comprises

oscillatory means providing a designated output frequency;

two sine generators driven by said output frequency of said oscillatory means for producing individual sine voltages bearing a designated phase angle relative to each other; and wherein

the coil arrangement has a plurality of coils which are arranged at equal angles from each other and surround the rotor, the coils being acted on in succession in each case by sine voltages which are a given angle apart.

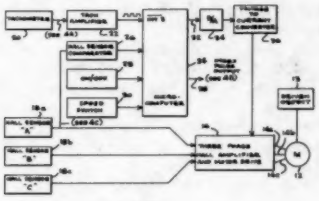
4,680,515
DIGITAL SPEED CONTROL OF MOTORS

James C. Crook, 6212 M North Hills, Raleigh, N.C. 27609

Filed May 21, 1985, Ser. No. 736,754

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—318 **18 Claims**



1. Motor control apparatus for controlling the rotational velocity of a drive shaft of an electric motor in accordance with a reference time period indicative of the desired rotation velocity of the drive shaft, said motor control apparatus comprising:

(a) first means coupled to the drive shaft for providing first signals, each first signal corresponding to a given angle of drive shaft rotation;

(b) second means responsive to said first signals for providing second signals indicative of the time period between said first signals;

(c) difference means responsive to said second signals for providing difference signals indicative of the differences between said reference time period and the time periods indicated by said second signals;

(d) speed control means comprising means for integrating said difference signals and means for dividing said integrated signals by a factor N to provide divided signals, where N is selected to control the gain of said motor control apparatus.

4,680,516
MOTOR SPEED CONTROL SYSTEM

Nahum Guzik, Mountain View; Gennady Mangeym, Sunnyvale, and James W. Jones, Woodside, all of Calif., assignors to Guzik Technical Enterprises, Sunnyvale, Calif.

Filed May 30, 1986, Ser. No. 868,735

Int. Cl.[4] G05B *19/28*

U.S. Cl. 318—326 **12 Claims**

1. A motor speed control system comprising:

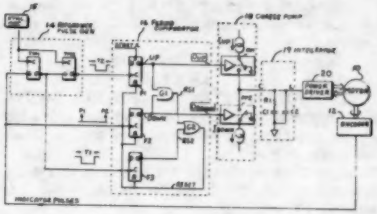
a motor;

encoding means connected to said motor for generating indicator pulses related to rotational speed of said motor;

period generator means comprising at least one counter which is initiated by said encoder means and generates a reference pulse period;

a period comparator connected to said encoder means and to said period generator means, said period comparator having means for comparing said reference period to a period of said indicator pulses of said encoder and for producing an output signal as a result of the comparison, said period comparator having resetting means which resets said period comparator in response to said output signal;

digital-to-analog converter means having an input and an output, said period comparator being connected to said input of said converter means; and



Motor Speed Control System

motor driver means responsive to the output signal of said converter means for controlling the speed of said motor, said driver means having an input and an output, said output of said driver means being connected to said motor.

4,680,517
MOTOR DRIVE CONTROL DEVICE

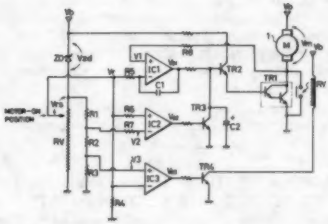
Kazunori Fujioka, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 25, 1985, Ser. No. 715,960

Claims priority, application Japan, Mar. 23, 1984, 59-41392[U]

Int. Cl.[4] H02P *5/06*

U.S. Cl. 318—332 **3 Claims**



1. A motor drive control device to control the speed of a motor comprising:

a DC motor,

a drive control section having a first terminal end connected with said motor and a second terminal end in series across said drive control section;

means for applying a source voltage (Vb) of a battery across said second terminal end of said drive control section and said motor,

a motor speed variable setting section including a variable control resistor for generating a variable setting value signal to be used by a first decision section to supply a variable control signal to said drive control section,

a resistor having one end connected to said first terminal end of said drive control section and its other end connected to said first decision section for providing a sensed value signal indicating the voltage at said first terminal end of said drive control section,

said first decision section having means for comparing the sensed value signal from said resistor and said setting value signal from said variable setting section and sending

the variable control signal to said drive control section for variably controlling the speed of said DC motor, and

a short-circuit decision section having means for short-circuiting said first and second terminal ends of said drive control section in response to a particular setting value signal set at said variable setting section, so as to apply the full source voltage (Vb) to said motor in order to obtain a maximum motor speed from said DC motor greater than which is obtained through operation of said drive control section.

4,680,518

SERVOMOTOR VELOCITY CONTROL METHOD

Mitsuo Kurakake, Hino; Keiji Sakamoto, and Yukio Toyosawa, both of Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

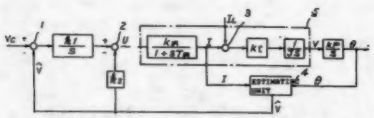
PCT No. PCT/JP86/00010, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1986, PCT Pub. No. WO86/04194, PCT Pub. Date Jul. 17, 1986

PCT filed Jan. 11, 1986, Ser. No. 908,701

Claims priority, application Japan, Jan. 12, 1985, 60-003702

Int. Cl.[4] G05B *13/00*

U.S. Cl. 318—561 **2 Claims**



1. A servomotor velocity control method in which position information from a rotary encoder mounted on a servomotor driving a mechanical load is fed back and a torque command signal is produced for application to the servomotor, said method comprising the steps of:

comparing a reference velocity set for said servomotor and the motor velocity;

calculating an estimated value of load torque when the motor velocity is less than said reference velocity;

calculating an estimated value of velocity of the servomotor based on position information from said rotary encoder, motor current of the servomotor and said estimated value of load torque; and

calculating the torque command signal based on said estimated value of velocity and a velocity command signal.

4,680,519

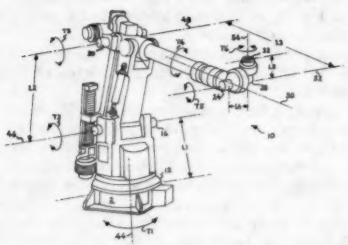
RECURSIVE METHODS FOR WORLD-TO-JOINT TRANSFORMATION FOR A ROBOT MANIPULATOR

Sujeet Chand, Charlottesville, Va., and Ahmad Sadre, Fox Point, Wis., assignors to General Electric Co., Charlottesville, Va.

Filed Sep. 23, 1985, Ser. No. 778,830

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—568 **12 Claims**



1. In an articulated manipulator of the type having at least a first, a second, and a third link respectively associated with a first, a second, and a third joint, a method of determining a first, a second, and a third joint angle, respectively, for each of the axis of rotation to provide control data for activating actuators being associated with a corresponding joint, to permit positioning of an end of the manipulator at a desired point, said method comprising the steps of:

(A) obtaining data identifying a desired end point position and orientation, the data including an end point position vector and an end point approach orientation vector;

(B) multiplying the end point approach orientation vector by the length of the first link;

(C) producing a first set of coordinates, by subtracting the result of step (B) of multiplying from the end point position vector;

(D) determining a first vector from the first set of coordinates along the first axis of rotation with a length of the first link;

(E) setting initially a second set of coordinates equal to the first set of coordinates;

(F) determining from the second set of coordinates a second vector along the third axis of rotation, with a length of the third link;

(G) calculating the cross-product of the first vector and second vector, to produce a third vector;

(H) multiplying the third vector by the length of the second link;

(I) computing an estimate of the second set of coordinates by subtracting the result of step (H) of multiplying, from the first set of coordinates;

(J) repeating steps (F) of determining, through steps (I) of computing, until the difference between any two successive estimations is less than a predetermined minimum value;

(K) determining said joint angles from the second set of coordinates;

(L) generating position commands from said joint angles; and

(M) sending the position commands to the actuator associated with a manipulator joint to control the manipulator joint.

4,680,520

ZERO-POINT RETURN METHOD

Kenichi Toyoda, Hino; Shinsuke Sakakibara, Komae, and Haruyuki Ishikawa, Tokyo, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT JP85/00395, §371 Date Mar. 7, 1986, §102(e) Date Mar. 7, 1986, PCT Pub. No. WO86/00728, PCT Pub. Date Jan. 30, 1986

PCT filed Jul. 12, 1985, Ser. No. 843,697

Claims priority, application Japan, Jul. 12, 1984, 59-144606

Int. Cl.[4] G05B *11/18*

U.S. Cl. 318—594 **2 Claims**

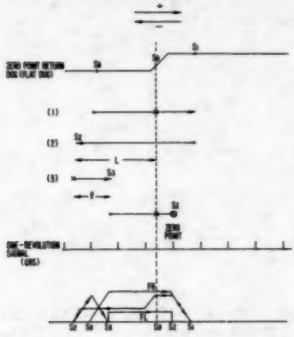
1. A zero-point return method in which a control unit for controlling a servomotor operating a movable machine element controls a zero-point return operation of the movable machine element based on a changeover signal produced by a flat dog, the method including:

(a) a first step in which the control unit stops the movable machine element when the changeover signal produced by said flat dog is detected, thereafter reverses the movable machine element and, after again receiving the changeover signal, moves the movable machine element a first predetermined distance and stops the movable machine element;

(b) a second step in which, after the first step ends, the control unit moves the movable machine element a second predetermined distance smaller than said first predetermined distance toward a changeover signal detection point and stops the movable machine element; and

(c) a third step in which, after the second step ends, the control unit moves the movable machine element in a

direction the same as that of the second step and stops the movable machine element at a first rotation signal of the



servomotor after the changeover signal produced by said is detected.

4,680,521

STABILIZATION AID FOR A VEHICLE-OR VESSEL-BORNE SEARCH UNIT

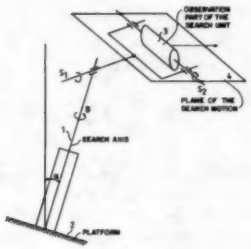
Jan Hofman, Haarboerhorst 21, Enschede, Netherlands

Continuation of Ser. No. 542,838, Oct. 17, 1983. This application Mar. 21, 1986, Ser. No. 842,765

Claims priority, application Netherlands, Oct. 19, 1982, 8204027

Int. Cl.⁴ B64C *17/06;* **H01Q** *1/34*

U.S. Cl. 318—649 **4 Claims**



1. A stabilization aid for a vehicle/vessel-borne search unit having an observation part mounted for continuous rotation about a search axis which is fixed with respect to the vehicle/vessel, said stabilization aid comprising:

(a) first and second servomechanisms for moving the observation part about two mutually-perpendicular axes S_1 and S_2, respectively, and which are perpendicular to the search axis, to stabilize said observation part with respect to an earth-fixed reference axis;

(b) means for measuring the angular velocity α of the observation part about the search axis and its angular position B relative thereto and for converting such measured values to signals ϕ_1 for controlling each of the first and second servomechanisms to stabilize the observation part against variations in α and B;

(c) a feed-forward circuit connected to said converting means for deriving from signals ϕ_i compensating signals ϕ_c, each such compensating signal corresponding to the variations in the corresponding control signal ϕ_i due to changes in α and B;

(d) and a computer for applying to each of the first and second servomechanisms for a signal ϕ'_i corresponding to the sum of the ϕ_i and ϕ_c signals for such servomechanisms, the ϕ'_i signals causing the servomechanisms to instantaneously compensate the observation part for disturbing torques caused by non-uniformities of motion thereof around the axes S_1 and S_2 due to inclination of the search axis with respect to the earth-fixed reference axis.

4,680,522

RADIATION PATH AXIS DIRECTING SYSTEM

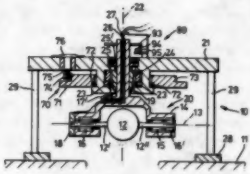
John S. St. Clair, Dunfermline, and Nicolas L. Brignall, Edinburgh, both of Scotland, assignors to Ferranti plc, Cheshire, England

Filed Nov. 8, 1985, Ser. No. 796,116

Claims priority, application United Kingdom, Nov. 9, 1984, 8425859

Int. Cl.⁴ G05B *1/06;* **G02B** *26/08;* **G01C** *3/08*

U.S. Cl. 318—664 **26 Claims**



1. A radiation path axis directing system comprising a body rotatable about a first axis each side of a datum point and supporting a reflector rotatable about a second axis in the body orthogonal to the first, said reflector being arranged to deflect a radiation path axis along the first axis either side of the second axis in dependence on the orientation of the reflector about the second axis, and control means including a body drive motor responsive to demand of a new radiation path axis to position the body at an angular position with respect to the datum position at which the second axis is orthogonal to the demanded radiation path axis and orientate the reflector about the second axis to cause the radiation path axis to be deflected at the appropriate side of the second axis to define the direction of the demanded radiation path axis.

4,680,523

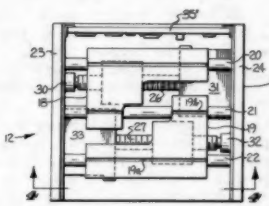
APPARATUS AND METHOD FOR HANDLING ARTICLES IN AUTOMATED ASSEMBLY PROCESSES

Peter G. Goumas, Cary, and Paul T. Wolfe, Apex, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Mar. 13, 1986, Ser. No. 839,346

Int. Cl.⁴ G05B *19/40*

U.S. Cl. 318—685 **24 Claims**



1. For use in connection with a robotic article handling apparatus, a gripper assembly for handling an article, comprising:

a housing,

a pair of fingers depending from said housing,

guided carriage means in said housing mounting said fingers for independent selective movement toward and away from one another,

a separate stepper motor operable in response to discrete electrical pulses and drivably connected to each finger for effecting said movement thereof in discrete incremental steps of predetermined extent and at selected step rates proportional to the rates of said electrical pulses, said step rates including a relatively high approach rate at which said finger is driven toward an article to be handled and a relatively low closing rate at which said finger is driven when in proximity with the article,

proximity sensing means associated with each finger for sensing its proximity with said article,

force sensing means associated with each finger for sensing the gripping forces generated by gripping engagement between the finger and said article,

compliant means associated with each finger for undergoing progressive displacement in respones to increase of said gripping forces,

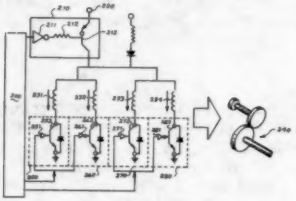
digital-type control means connected to each said motor and sensing means for so controlling the rate of said electrical pulses as to cause said motor to vary the step rate of said incremental movement of said finger driven thereby, said control means being operable in response to sensed proximity of said finger to said article to cause reduction of the rate of movement of said finger from its said approach rate to its said closing rate, and said control means being operable to cause cessation of movement of said finger when a predetermined magnitude of gripping force has been sensed by said force sensing means.

4,680,524

MECHANISM FOR POSITIONING AN OUTPUT MEMBER

Phuc K. Do, Charlotte; Joel G. Goodwin, Concord, and Nicholas J. Krull, Charlotte, all of N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,255
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **7 Claims**



1. A mechanism for positioning an output member comprising a step motor, a mechanical transmission connecting said step motor to said output member, and means for controlling said step motor, wherein the improvement comprises:

means in said controlling means providing a movement command specifying a number of steps to be performed by said step motor;

means for delivering units of electrical energy to said step motor in response to the number of steps specified to be performed by said step motor to move said output member to a desired position, each of said units being delivered in succession to said motor to urge movement of said motor in the same direction, said electrical energy delivering means comprising;

means for detecting the condition that a single step remains to be performed; and

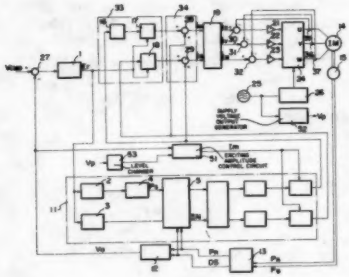
means responsive to whether a single remaining step is detected for selectively supplying electrical energy units to said step motor at different energy time rates, wherein the rate at which an energy unit for a single remaining step delivers energy to said step motor is substantially slower than the rate at which energy is supplied by units delivered for the other steps specified to be performed by said step motor.

4,680,525

INDUCTION MOTOR DRIVING SYSTEM

Katsuo Kobari, Tachikawa, and Hiroshi Ishida, Tokyo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 413,334, Aug. 23, 1982, abandoned.
This application May 2, 1985, Ser. No. 728,467
Claims priority, application Japan, Dec. 30, 1980, 55-186753
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—798 **4 Claims**



1. An induction motor driving system operatively connected to an induction motor generating a rotational speed signal and a driving supply voltage and operatively connected to receive an exciting current command signal, said induction motor driving system comprising:

exciting current amplitude controlling means, operatively connected to the induction motor, for receiving the rotational speed signal and outputting an amplitude signal;

means, operatively connected to said exciting current amplitude controlling means and the induction motor, for receiving the amplitude signal and increasing the current amplitude of the induction motor in dependence upon the amplitude signal;

detecting means, operatively connected to the induction motor, for receiving and detecting the level of the driving supply voltage of the induction motor and varying the rotational speed signal in accordance with the level of the driving supply voltage;

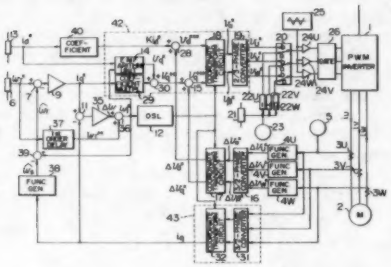
a supply voltage output circuit providing a supply voltage; and

a level changer, operatively connected between said supply voltage output circuit and said exciting current amplitude controlling means, for receiving and level changing the supply voltage and providing the level changed supply voltage and the rotational speed signal to said exciting current amplitude controlling means.

4,680,526
METHOD OF CONTROLLING INVERTER-DRIVEN INDUCTION MOTOR

Toshiaki Okuyama, Ibaraki; Takayuki Matsui, Hitachi; Noboru Fujimoto, Hitachi, and Yuzuru Kubota, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,945
Claims priority, application Japan, Aug. 21, 1984, 59-173713; Apr. 5, 1985, 60-72875
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—802 **2 Claims**



1. A method of controlling an induction motor driven by a voltage-type inverter, wherein the magnitude and phase of a primary current supplied to said induction motor are controlled by controlling a torque current component and an exciting current component independently and by controlling an output voltage of said inverter, said method comprising the steps of:

detecting a value of said primary current flowing to said induction motor;

determining said torque current component based on the detected value of said primary current and a phase reference signal for controlling said output voltage of said inverter;

controlling said output voltage and corresponding frequency of said votlage-type inverter in accordance with said torque current component;

estimating rotational speed of said induction motor based on said torque current component;

comparing said estimated rotational speed of said induction motor with a speed command signal; and

controlling the rotational speed of said induction motor based on the result of such comparison.

4,680,527
ELECTRICAL BATTERY INCLUDING APPARATUS FOR CURRENT SENSING

Robert L. Benenati, Tamarac, and Wayne K. Moy, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 6, 1986, Ser. No. 894,217
Int. Cl.[4] H02J *7/00*; **H01M** *10/44*
U.S. Cl. 320—2 **3 Claims**

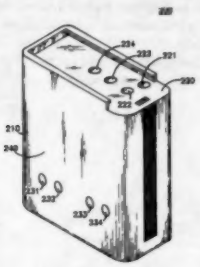
1. A multicell battery adapted for interconnection to an energy consuming electronic device comprising:

a battery housing having an external surface;

a plurality of cells coupled together in series and situated in said housing and including positive and negative electrical terminals at opposed ends of said plurality of cells;

first and second electrical contacts situated on the external surface of said battery housing and coupled to said positive and negative terminals, respectively;

a first resistor connected in series between two adjacent cells of said plurality of cells to form the connection between said adjacent cells, said resistor having opposed ends, and

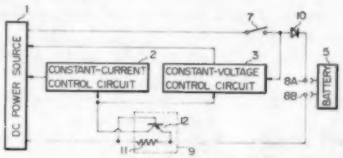


third and fourth electrical contacts situated on the external surface of said battery housing, each coupled to a respective end of said first resistor.

4,680,528
BATTERY CHARGING DEVICE

Toshio Mikami, and Yasuo Nagasawa, both of Saitama, Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Mar. 4, 1986, Ser. No. 835,935
Claims priority, application Japan, Mar. 5, 1985, 60-31268[U]
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—32 **2 Claims**



1. A battery charging device, comprising:

a DC power source, output terminals for a battery, and a charging-starter switch connected between said DC power source and said output terminals so as to provide DC power at the output terminals by turning on the charging-starter switch;

a current detecting circuit connected to the output terminals for detecting whether or not a battery is connnected to the output terminals and for detecting a current flowing to the battery;

a voltage control circuit responsive to a signal derived from said current detecting circuit to provide a charging voltage or stand-by voltage of a predetermined magnitude at the output terminals; and

a current control circuit responsive to said signal to charge the battery with a current of a predetermined magnitude;

said current detecting circuit being OR-connected to said voltage control circuit and to said current control circuit.

4,680,529

APPARATUS FOR CONTROLLING GENERATOR FOR VEHICLE

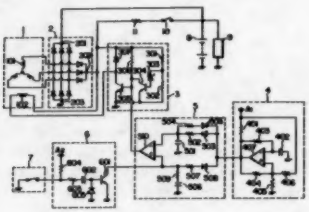
Keiichi Komurasaki; Shiro Iwatani, and Shinji Nishimura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 27, 1986, Ser. No. 866,979

Claims priority, application Japan, May 31, 1985, 60-82742[U]

Int. Cl.[4] H02J *7/14*; H02P *9/10*

U.S. Cl. 322—28 **4 Claims**



1. A control apparatus for a vehicle generator having an output voltage connected to a battery, said apparatus controlling the output voltage of the generator by controlling the field winding current of the generator comprising:

an operating state detector for detecting an operating state of said vehicle and for generating an output signal representative thereof,

a reference clock generator for producing reference clock pulses,

regulator means connected to the field winding for varying the field current and controlling the output voltage of said vehicle generator to a predetermined regulated value in accordance with modulated reference clock pulses, and

a modulator means operated responsive to an output signal from said operating state detector for gradually changing the width of the reference clock pulses upon the occurrence of said operating state for gradually varying the field current to gradually reduce the output voltage of the generator connected to the battery over a predetermined period after the occurrence of the operating state of said vehicle.

4,680,530

VOLTAGE REGULATOR FOR GENERATOR USED IN AUTOMOBILE

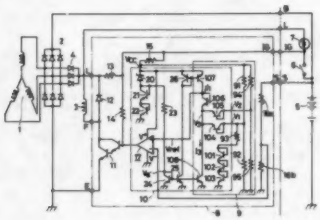
Keiichi Mashino, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1986, Ser. No. 824,087

Claims priority, application Japan, Feb. 1, 1985, 60-16555; Feb. 20, 1985, 60-30411

Int. Cl.[4] H02J *7/14*

U.S. Cl. 322—33 **9 Claims**



1. In a voltage regulator of a generator for an automobile, said voltage regulator having a comparator for comparing an output voltage of the generator with a reference voltage and including means for regulating the output voltage of the generator, a reference voltage generating means comprising:

a constant voltage source for generating a constant voltage, said constant voltage source having a positive pole and a negative pole;

first and second voltage dividers connected across said constant voltage source for dividing the voltage of said constant voltage source;

a series circuit comprised of a thermo-sensitive element and a resistor that are connected between a voltage division point of said first voltage divider and said negative pole of said constant voltage source;

a first diode having an anode thereof connected to a voltage division point of said first voltage divider and having a cathode;

a second diode having an anode thereof connected to a voltage division point of said second voltage divider and a cathode thereof connected to the cathode of said first diode; and

a third diode having a cathode thereof connected to the cathode of said first and second diodes, and providing said reference voltage at an anode thereof.

4,680,531

METHOD FOR ATTENUATING AT LEAST ONE ELECTRIC HARMONIC OF THE SYSTEM FREQUENCY IN A MULTI-PHASE ALTERNATING-CURRENT SYSTEM

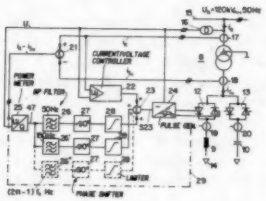
Antoine Rey, Basel, and Herbert Stemmler, Kirchdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 19, 1986, Ser. No. 898,019

Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616334

Int. Cl.[4] G05F *1/70*

U.S. Cl. 323—206 **19 Claims**



1. Method for attenuating at least one electric harmonic with respect to the system frequency in a multi-phase alternating-current system, to which is connected at least one impedance by a magnetically saturable transformer and at least one phase-controlled alternating current switch which is controlled as a function of an equidistant control signal of a current/voltage controller, comprising:

generating a stabilizing signal as a function at least of the current through said at least one impedance;

generating at least one electric power signal as a function of the input voltage of the transformer and as a function of at least the current through one impedance;

filtering each power signal for each electric harmonic to be compensated;

phase-displacing each filtered power signal by +90°; and

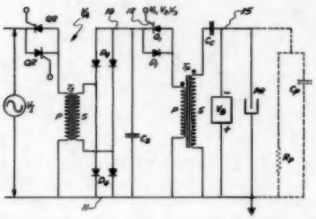
superimposing each filtered and phase-displaced power signal on the equidistant output signal of the current/voltage controller for use as a control signal for the alternating-current switches.

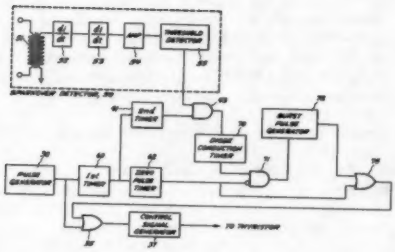
4,680,532

FALSE TRIGGERING PROTECTION FOR SWITCHING DEVICE OF A CAPACITIVE LOAD PULSER CIRCUIT

Abdallah M. Itani, Ballston Spa; Peter W. Dietz, Greenwich, and Gerald J. Carlson, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,458
Int. Cl.[4] B03C *3/01*
U.S. Cl. 323—240 16 Claims





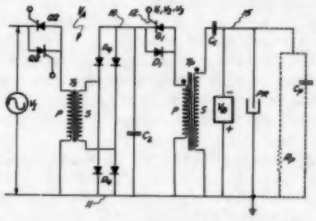
1. A circuit for generating a voltage pulse across a load, the load voltage pulse being characterized by an initial period during which said voltage rises from a base value toward a peak, followed by a period during which said load voltage returns to said base value near the termination of said voltage pulse, said circuit comprising a switching element having a control electrode, means for applying a first control signal to said control electrode to initiate current conduction through the element in a first direction accompanied by said rise in voltage across said load, means for terminating current through said element near said peak, means for shunting current around said element in a direction opposite to said first direction during an energy recover period accompanied by a decreasing load voltage, means for protecting said element from damage due to sparkover occurring in said load by applying a second control signal to said control electrode in response to a detected sparkover to render said element substantially conductive during at least a portion of said pulse, said second control signal adapted to maintain said switching element in a substantially conductive state independent of the actual time at which said sparkover is detected at least through the time when said termination of said pulse would occur if no sparkover had actually taken place.

4,680,533

PROTECTION ARRANGEMENT FOR SWITCHING DEVICE OF A CAPACITIVE LOAD PULSER CIRCUIT

Abdallah M. Itani, Ballston Spa; Gerald J. Carlson, Scotia, and Peter W. Dietz, Greenwich, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,459
Int. Cl.[4] B03C *3/01*
U.S. Cl. 323—240 19 Claims



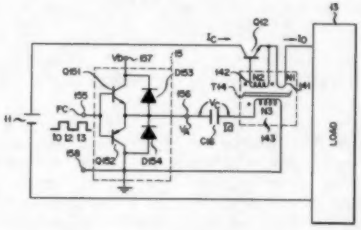
1. In a circuit for generating a voltage pulse across a load, the load voltage pulse being characterized by a period of rising voltage followed by a period of falling voltage, said periods separated by a transition period, said circuit comprising a switching element having a control electrode which serves to initiate heavy current conduction through the element in response to a control pulse, said current falling to zero during said transition period, current being thereafter shunted around said element during said period of falling load voltage, an improved means for protecting said element from damage due to sparkover occurring in said load comprising means for applying a first control pulse to said control electrode to initiate said load voltage pulse and means for applying a second control pulse during the occurrence of each said transition period to said control electrode to render said element substantially conductive within said transition period.

4,680,534

DRIVE METHOD FOR SWITCHING POWER CONVERTER AND APPARATUS USING THIS METHOD

Yoshio Tanaka, Kanagawa, and Toshihiro Onodera, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1986, Ser. No. 843,383
Claims priority, application Japan, Mar. 29, 1985, 60-65238; Jan. 30, 1986, 61-18716
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—290 10 Claims



1. A drive method for a switching power converter which includes a current transformer having primary, secondary, and tertiary windigs wound around a saturable magnetic core, and a switching transistor having a base emitter path or base-collector path positively feedback-coupled through the primary

and secondary windings of said current transformer, said drive method comprising the steps of:

(a) applying a drive pulse to the tertiary winding of said current transformer to turn on said switching transistor at a leading edge of said drive pulse, so that an emitter current or collector current of said switching transistor flows into the primary winding of said current transformer;

(b) magnetically saturating the core of said current transformer by the emitter current or collector current of said switching transistor, so that an inductance of the secondary winding of said current transformer is reduced by magnetic saturation of said core;

(c) flowing a turn-off current, in a direction to turn off said switching transistor, between said secondary winding and the base of said switching transistor upon a decrease in inductance at the secondary winding of said current transformer; and

(d) setting a trailing edge of said drive pulse applied to the tertiary winding of said current transformer to occur at a time after the flow of said turn-off current is terminated, wherein an ON/OFF duty cycle of said switching transistor can be changed by changing a period from the trailing edge of said drive pulse to the next leading edge thereof.

4,680,535

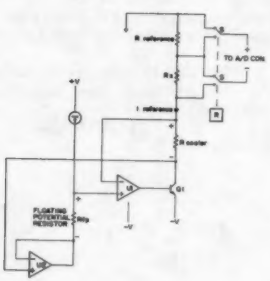
STABLE CURRENT SOURCE

Shlomo S. Talmor, Syosset, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 788,236, Oct. 17, 1985. This application Jan. 29, 1986, Ser. No. 823,672

Int. Cl.[4] G05F *3/04*

U.S. Cl. 323—312 **15 Claims**



1. A stable current source circuit for supplying a current of known magnitude Iref, comprising a scaler resistor having the current of known magnitude Iref passing therethrough to develop a voltage drop thereacross, a floating potential circuit connected to said scaler resistor in a loop circuit, and a differential amplifier coupled to differentially measure the voltages across said scaler resistor and said floating potential circuit and provide an output indicative thereof which determines Iref, such that the voltage drop across the scaler resistor equals the voltage drop across the floating potential and the current Iref through said scaler resistor remains constant at a known magnitude.

4,680,536

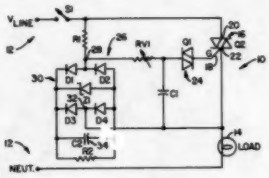
DIMMER CIRCUIT WITH INPUT VOLTAGE COMPENSATED SOFT START CIRCUIT

Lynn Roszel, Richardson, and Jim Tabor, Dallas, both of Tex., assignors to Prescolite, Inc., San Leandro, Calif.

Continuation of Ser. No. 467,233, Feb. 17, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,543

Int. Cl.[4] G05F *5/02*

U.S. Cl. 323—321 **2 Claims**



1. A circuit for controlling the delivery of A.C. electrical voltage from a source to a load comprising:

a. switch means for selectively conducting current from a A.C. source to the load, and switch means including gate lead means for initiating said selective conduction of current from the A.C. source to the load;

b. means for triggering said gate lead means of said switch means, said triggering means being operably connected in series with said gate lead means of said switch means;

c. means for activating said triggering means during a selected time interval to cause said switch means to conduct current from the A.C. source to the load during a period relative to said selected time interval when said triggering means is activated, said activating means being operatively connected to said triggering means, said means for activating said triggering means including;

a variable resistor;

a capacitor, said capacitor being connected to said variable resistor;

means for producing a regulated square wave voltage for driving said variable resistor and connected capacitor, said means for producing a regulated square wave voltage for driving said variable resistor and connected capacitor being connected in parallel with said capacitor and variable resistor between said line source of A.C. voltage and the load, said means for producing a regulated square wave voltage including a full wave rectifier bridge and a regulator diode connected across said bridge; and

d. means for delaying the operation of said activating means causing said switch means to progressively increase successive periods of conduction of current from the source to the load, said means for delaying the operation of said activating means comprising a capacitor connected across said means for producing a regulated square wave voltage such that said capacitor charges to the value of said regulated square wave voltage.

4,680,537

METHOD AND APPARATUS FOR TESTING A CONDUCTIVITY SENSING CIRCUIT

Francis M. Miller, Snyder, N.Y., assignor to Conax Florida Corporation, St. Petersburg, Fla.

Filed Apr. 12, 1985, Ser. No. 722,679

Int. Cl.[4] G01R *31/02*

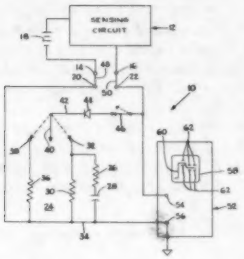
U.S. Cl. 324—500 **14 Claims**

1. Apparatus for testing a circuit which senses the condition of an electrical quantity, said quantity being electrical conductivity, said sensing circuit having a pair of sensing terminals, a sensor portion operatively connected to said terminals for indicating a predetermined condition of the electrical quantity associated with a load connected between said terminals, and a current conducting component which is activated in response

to a predetermined amount of energy supplied thereto after said sensor indicates said condition of said electrical quantity, said component to be activated in response to conductivity greater than a given value, said testing apparatus comprising:

(a) a pair of terminals for connection to said sensing circuit terminals;

(b) a network connected to said terminals for simulating a load having the electrical quantity to which said sensing circuit is responsive, said network having at least one branch which simulates the existence of said predeteremined condition in said load, said branch including timing means causing said predetermined condition to be simulated for a period of time adequate to test the response of



said sensing circuit but inadequate to provide sufficient energy to activate said component, said network branch having an initial low resistance to simulate conductivity greater than said given value and which then is changed in response to said timing means to a high resistance to simulate conductivity lower than said predetermined value thereby enabling testing the electrical continuity of said component in response to conductivity greater than said given value and in a manner preventing activation of said component; and

(c) monitoring means connected to said terminals for comparing the actual response of said sensing circuit to the load simulation provided by said network to the desired response of said network.

4,680,538

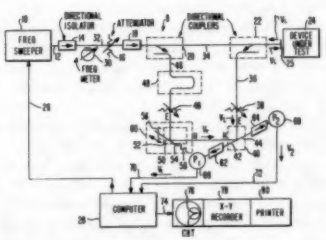
MILLIMETER WAVE VECTOR NETWORK ANALYZER

G. Conrad Dalman, and Hiroshi Kondoh, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 15, 1985, Ser. No. 691,613

Int. Cl.[4] G01R *27/04*

U.S. Cl. 324—58 R **21 Claims**



1. A millimeter wave vector network analyzer, comprising:

a source of millimeter wave signals;

waveguide means for directing said signals onto a device to be tested;

a first directional coupler connected to said waveguide means for providing a reference sample of the signal incident on said device;

a reference waveguide channel for receiving said reference sample;

a second directional coupler connected to said waveguide means for providing a test sample of the signal reflected from said device;

a test waveguide channel for receiving said reflected signal test sample; a magic tee hybrid, having two inputs and two outputs;

controllable phase shifter means connected in at least one of said reference and test waveguide channels;

means connecting said reference channel to a first input of said hybrid to direct said reference sample to said hybrid;

means connecting said test channel to a second input of said hybrid to direct said test sample to said hybrid, said hybrid combining said reference and said test samples vectorially;

first and second power detectors connected to first and second outputs, respectively, of said hybrid, said power detectors providing scalar information which is a function of the magnitude of the reflection coefficient of said device and the phase of the reflection coefficient of said device; and

means responsive to said scalar information to provide the phase and magnitude of the reflection coefficient of said device.

4,680,539

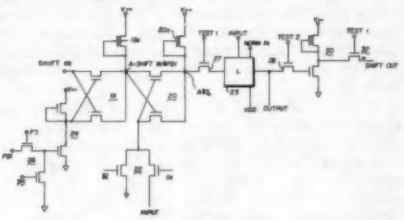
GENERAL LINEAR SHIFT REGISTER

Mon Y. Tsai, River Vale, N.J., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,217

Int. Cl.[4] G01R *31/28;* **G11C** *19/00*

U.S. Cl. 324—73 R **6 Claims**



1. A programmable linear feedback shift register for self-testing a VLSI circuit, said register having a plurality of two bit stages, each stage comprising:

a first exclusive NOR circuit for receiving a binary shift signal from a preceding stage, and a feedback signal;

a second exclusive NOR circuit for receiving a first logical signal from said first exclusive NOR circuit, and an input signal;

a cross-coupled register connected to receive a signal from said VLSI circuit during normal VLSI circuit operation, and a signal from said second exclusive NOR circuit during a test operation;

an inverter circuit for receiving an output signal from said cross-coupled register, said inverter circuit supplying a shift signal for application to a subsequent stage first exclusive NOR circuit; and

means for coupling said second exclusive NOR circuit output during a first test interval to said cross-coupled register, and an output signal from said cross-coupled register to said inverter during a second test interval.

4,680,540

DEVICE FOR MEASURING AVERAGE FREQUENCIES

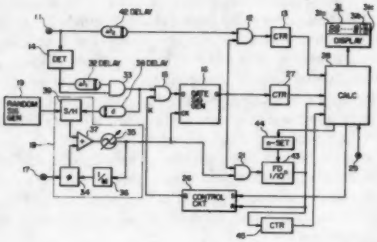
Shoji Niki, Kitaadachi; Toshiro Takahashi, and Yohei Hirakoso, both of Gyoda, all of Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,791

Claims priority, application Japan, Jul. 18, 1983, 58-131345

Int. Cl.[4] G01R *23/02*

U.S. Cl. 324—78 R **22 Claims**



1. A device for measuring the average frequency of a carrier wave of burst signals with a predetermined desired accuracy R, comprising:

an input terminal for receiving thereat said burst signals;

clock generator means for generating clock signals of a period Tc;

preliminary gate signal generator means connected to said input terminal for generating preliminary gate signals in response to said burst signals, each of said preliminary gate signals defining an approximate continuous counting time for each corresponding one of said burst signals;

a gate signal generating means connected to the output side of said preliminary gate signal generator means, for outputting respective synchronized gate signals;

a first gate connected to the output of said gate signal generating means for receiving therefrom said synchronized gate signals and allowing said burst signals to pass through said first gate during the respective synchronized gate signals;

a second gate connected to the output of said gate signal generating means for receiving therefrom said synchronized gate signals and allowing said clock signals to pass through said second gate during the durations of said synchronized gate signals;

a first counter means connected to the output of said first gate for counting the number F of cycles of said burst signals having passed through said first gate;

a frequency dividing means connected to the output of said second gate for receiving therethrough said clock signals and frequency-dividing them by in accordance with a preset value n which is an integer equal to or greater than 1;

setting means connected to said frequency dividing means for setting said preset value n thereinto;

a second counter means connected to the output of said frequency dividing means for counting the number K of frequency-divided clock signals from said frequency dividing means;

a third counter means connected to the output of said gate signal generating means for counting the number N of said synchronized gate signals therefrom;

gate signal control means for starting and stopping the generation of said synchronized gate signals by said gate signal generating means in response to a control signal and the output from said frequency dividing means, respectively;

frequency-division-ratio determing means for supplying said control signal to said gate signal control means, thereafter calculating a value of $(Na/R)\times(1/Tc)$ from a count Na of said third counter means at the time the first output is produced from said frequency dividing means, the accuracy R, and the period Tc of the block signals, determining $P\times 10^n$ greater than the close to said value, and supplying the n to said setting means, where P is an integer of 2 equal to or greater then;

repetition means for repeatedly supplying said control signal to said gate signal control means, picking up the count F from said first counter means each time the output is produced from said frequency dividing means, and resetting said first counter means;

a buffer memory for storing the count F from said first counter means;

calculating means for calculating an average value f of the counts F each time the count F is picked from said first counter means, based on the at most K of the most recent counts F stored in said buffer memory and a count k from said second counter means, and for determining an average frequency $f/(10^n\times Tc)$ of said input burst signals from said average value;

transition detecting means for detecting a condition in which said count k is equal to or less than $(P-1)$; and

a display unit for displaying the average frequency produced by said calculating means and the condition of k is equal to or less than $(P-1)$.

4,680,541

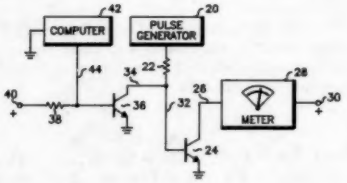
METER DRIVE INHIBIT CIRCUIT

William J. Barbiaux, Schaumburg, and Eugene L. Wineinger, Carol Stream, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 629,142, Jul. 9, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 924,101

Int. Cl.[4] G01R *1/20, 19/00*

U.S. Cl. 324—128 **1 Claim**



1. A meter drive circuit for use with a vehicle having a drive shaft that rotates, the meter drive circuit comprising:

pulse generator means for providing a pulse output at a frequency related to rotation of said drive shaft;

meter drive means for receiving said pulse output and for providing a meter drive signal in response thereto, said meter drive means including a first transistor that can be biased on and off by said pulse generator means to thereby provide said meter drive signal;

a meter device having a deflecting needle, the deflection of which depends on said meter drive signal;

inhibit means responsive to initially powering up said meter drive circuit for inhibiting said first transistor from providing said meter drive signal to said meter device for a predetermined time period upon initial application of power to said meter drive circuit, wherein said inhibit means includes a second transistor that can be switched into:

a first conductive state to that causes said first transistor to switch off; and

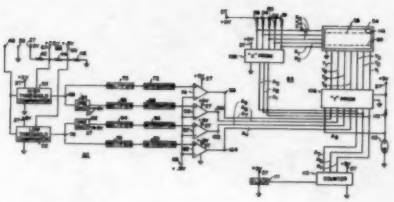
a second conductive state that allows said first transistor to respond to said pulse generator means.

4,680,542

LOGIC CIRCUIT TESTER

Gerald L. Krupp, 3214 Eighth Ave., Huntsville, Ala. 35805

Filed May 22, 1985, Ser. No. 736,857
Int. Cl.[4] G01R *19/16, 31/02*
U.S. Cl. 324—133 7 Claims



1. A logic circuit tester comprising:

sampling means for making electrical contacts across a logic circuit and providing a signal output representative of the logic signal present;

first circuit means responsive to said signal output for providing one selected signal state as a first discrete electrical output within a selected period when said signal output is representative of a logic signal which is above a selected upper threshold level for at least a selected percentage of the cycle of said logic signal, and a different signal state within said selected period when said signal output is not above said upper threshold level for a said selected percentage of the said cycle of said logic signal;

second circuit means responsive to said signal output for providing one selected signal state within said selected period as a second discrete electrical output upon the logic signal passing through said selected upper threshold level in a said cycle, and a different signal state within said selected period when said logic signal does not pass through said selected upper threshold level in a said cycle;

third circuit means responsive to said signal output for providing one selected signal state as a third discrete electrical output within said selected period when said signal output is representative of a logic signal which is lower than a selected lower threshold level, which lower threshold level is lower than said upper threshold level, for at least a selected percentage of the cycle of said logic signal, and a different signal state within said selected period when said logic signal is not lower than said selected lower threshold level for at least a selected percentage of the cycle of said logic signal;

fourth circuit means responsive to said signal output for providing one selected signal state as a fourth discrete electrical output within a selected period upon the occurrence in a logic cycle of the logic signal passing through said lower threshold level, and a different signal state within said selected period when said logic signal does not pass through said lower threshold level during a logic cycle; and

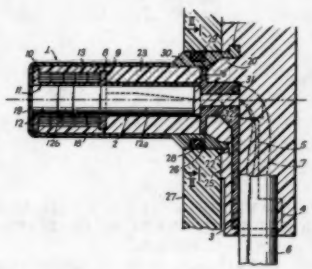
output means responsive to simultaneous said first, second, third, and fourth discrete electrical outputs for electrically combining said electrical signal outputs and distinctively indicating the discrete occurrence of each of a plurality of different combinations of signal states of said first, second, third, and fourth outputs.

4,680,543

PICKUP HAVING ENCAPSULATED ELECTRICAL AND MAGNETIC ELEMENTS

Isak Kohen, Rillieux la Pape, France, assignor to Societe a Responsabilite Limitee l'Electricfil Industrie, France

Filed Feb. 24, 1986, Ser. No. 833,323
Claims priority, application France, Feb. 26, 1985, 85 03006
Int. Cl.[4] G01P *1/02, 3/488;* G01B *7/30;* H01F *27/02*
U.S. Cl. 324—208 8 Claims



1. An electromagnetic pickup including:

an insulating body, a protective cover wherein said body is disposed, a magnetic element disposed within an axial passage in a spool portion of said body disposed at one end thereof, a pickup winding supported by said spool portion and wound thereabout, first and second conducting wires connected to said winding and extending axially along said body and beyond its other end, a plastic encapsulation disposed within said cover with said body and elements mounted thereon being embedded within said encapsulation;

said body including external self-centering means extending from said body transverse to the axis thereof for radially positioning said body within said cover;

said cover comprising an insulating tubular sleeve closed at one end by a transverse wall and being open at its other end, said cover including an anchoring flange at said other end;

said self-centering means being disposed within said sleeve in engagement with its internal surface;

said encapsulation also extending outside of said sleeve and forming a support seat covering said anchoring flange and a portion of said body that extends outside of said sleeve through the open other end thereof, with said wires extending through said seat and emerging therefrom at a location remote from said one end of said body.

4,680,544

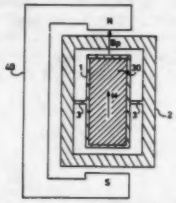
TORSION TYPE MAGNETIC FIELD MEASUREMENT DEVICE

Felix Rudolf, Cortaillod, Switzerland, assignor to Centre Electronique Horloger SA, Switzerland

Filed Mar. 6, 1984, Ser. No. 586,815
Claims priority, application France, Mar. 7, 1983, 83 03692
Int. Cl.[4] G01R *33/02*
U.S. Cl. 324—259 16 Claims

1. A miniature magnetic-field sensitive device comprising a flap; a support; first and second torsion hinges on opposite sides of said flap to attach said flap to said support and defining a hinge axis of rotation for said flap; a ferromagnetic coating on said flap and magnetized in a direction perpendicular to said

axis; and means on said support for creating a polarization field in the plane of said flap and perpendicular to its hinge axis of



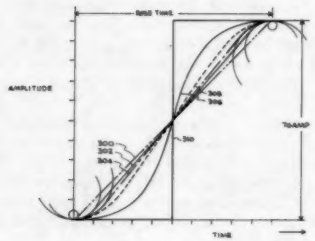
rotation, said polarization field magnetizing the ferromagnetic coating.

4,680,545

METHOD FOR REDUCTION OF ACOUSTICAL NOISE GENERATED BY MAGNETIC FIELD GRADIENT PULSES

Floyd L. Gray, Hales Corners; Thomas F. Schubert, Pewaukee; Kenneth M. Bradshaw, Waukesha, and Joshua O. Kolawole, Wauwatosa, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jan. 4, 1985, Ser. No. 688,677
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **7 Claims**



1. A method of reducing acoustical noise generated by high frequency components of current pulses used to energize magnetic field gradient coils which form part of an MR scanner apparatus, said method comprising the steps of:

shaping at least one of the leading and trailing edges of at least one of said current pulses used to energize at least one of said magnetic field gradient coils so as to substantially eliminate said high frequency components; and

applying said shaped current pulse to said one of said gradient coils.

4,680,546

METHODS OF, AND PULSE SEQUENCES FOR, THE SUPRESSION OF UNDESIRED RESONANCES BY GENERATION OF QUANTUM COHERENCE IN NMR IMAGING AND SPECTROSCOPY

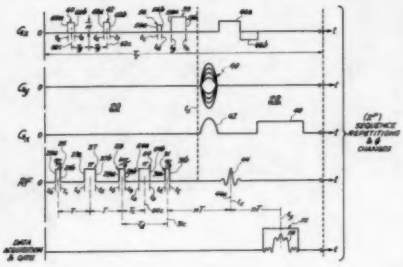
Charles L. Dumoulin, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,730
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **20 Claims**

1. A method for suppressing undesired response signals in nuclear magnetic resonance (NMR) imaging while obtaining desired NMR signals receivable from a sample containing nuclei which are spin-coupled to one another, comprising the steps of:

(a) evoking a NMR response signal from the sample responsive to an excitation signal sequence;

(b) preceding each NMR excitation signal sequence with a signal subsequence predeterminately selected for generating at least one selected one of zero-quantum and multiple-quantum coherence of the spin populations of a selected coupled-spin system in the sample;



(c) providing at least one detection signal in the subsequence for converting the at least one selected coherence into a desired NMR response signal receivable from the sample, while simultaneously substantially decreasing the final response amplitude of at least one single-quantum coherence signal present in the total response signal from the sample; and

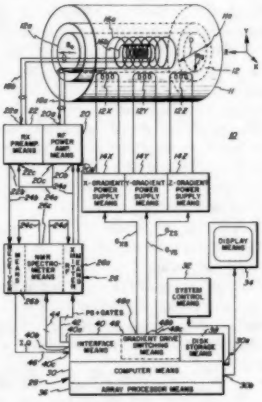
(d) generating an image of the sample responsive to the at least one selected coherence.

4,680,547

GRADIENT FIELD SWITCH FOR IMPROVED MAGNETIC RESONANCE IMAGING/SPECTROSCOPY SYSTEM

William M. Leue, Albany; Raymond J. Hodsoll, Jr., Galway, both of N.Y.; Gary H. Glover, Oconomowoc, Wis., and John T. Adamchick, Amsterdam, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,115
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **13 Claims**



1. In a nuclear magnetic resonance system for the production of localized chemical-shifted spectra and images from a non-ferromagnetic sample positioned in a system imaging volume

containing a main static magnetic field, said system including a plurality N of means each for generating a different magnetic field gradient in the main static magnetic field along only one associated different one of a plurality N of substantially orthogonal axes of said imaging volume, with each magnetic field gradient having characteristics established by one associated one of a like plurality N of gradient-defining signals, the improvement of said system including a gradient field switch comprising:

a plurality N of input means each for receiving a different one of the like plurality N of gradient-defining signals;

a like plurality N of output means each for providing one of a like plurality N of output signals to one associated different one of the magnetic gradient field generating means;

means for switching the gradient-defining signal received at any one of the input means to a selected one of the output means, different from all other ones of the output means to which any other signal from any other one of the input means is switched; and

means receiving data from the system for controlling the present configuration of said switching means between said input means and said output means to select a desired one of a plurality of viewing directions, each definable with respect to the axes of the sample-containing volume, without requiring movement of said sample or any physical portion of said system.

4,680,548

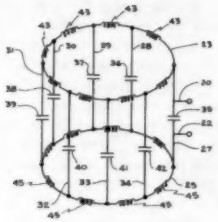
RADIO FREQUENCY FIELD COIL FOR NMR

William A. Edelstein; John F. Schenck, both of Schenectady; Otward M. Mueller, Ballston Lake, all of N.Y., and Cecil E. Hayes, Wauwatosa, Wis., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 659,043, Oct. 9, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 884,674

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **17 Claims**



1. An NMR radio frequency (RF) coil comprising:

a pair of conductive loop elements spaced along a common longitudinal axis, each of said conductive loop elements including a plurality of serially-connected capacitive elements spaced along the peripheries thereof; and

a plurality of axial conductive segments electrically interconnecting said conductive loop elements at points between adjacent ones of said serially-connected capacitive elements.

4,680,549

NMR COIL ARRANGEMENT

Jukka Tanttu, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Jan. 10, 1985, Ser. No. 690,303

Claims priority, application Finland, Jan. 20, 1984, 840232

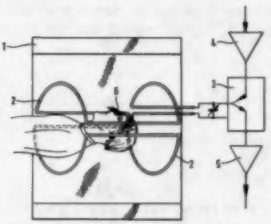
Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **13 Claims**

1. A coil arrangement for an NMR apparatus for obtaining NMR data from a target to be examined, said arrangement comprising:

first coil means (2) for exciting the nuclei of a target area by transmitting a radio frequency signal during a period of signal transmission and for receiving a signal emitted by the nuclei of the target area during a period of NMR signal detection; and

second coil means (6) electrically unconnected from said



first coil means but having a magnetic coupling to said first coil means, said second coil means being placed in the vicinity of a limited section of a target for enhancing the magnitude of a signal emitted by the limited section of the target, the signal enhancement obtained by said second coil means changing the relative contributions to the total received signal from the portions attributable to the limited and other sections of the target area in favor of the signal portion from said limited section.

4,680,550

HIGH-FREQUENCY ANTENNA DEVICE IN APPARATUS FOR NUCLEAR SPIN TOMOGRAPHY AND METHOD FOR OPERATING THIS DEVICE

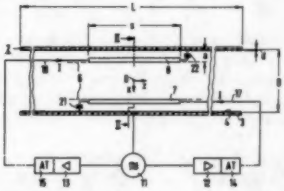
Norbert Krause, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,635

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410204

Int. Cl.[4] G01B *33/20*

U.S. Cl. 324—318 **20 Claims**



1. An antenna device for generating a high-frequency magnetic field in an apparatus for nuclear spin tomography, comprising:

(a) an energy source;

(b) at least two conductor sections of predetermined length which extend on an imaginary cylinder surface parallel to the direction of the axis of the imaginary cylinder and are arranged for current flow in opposite directions when one end of each of said sections is connected to said energy source;

(c) a tubular enclosure arranged at a predetermined distance concentrically with respect to the imaginary cylinder surface, surrounding the conductor sections, said enclosure being at least largely permeable to low frequencies for magnetic gradient fields, containing electrically highly conductive material and connected to said energy source,

said tubular enclosure extending in the axial direction beyond the end of the conductor sections by a predetermined amount to form a circular waveguide antenna with aperiodic wave propagation in a cut-off mode at the axial ends of said enclosure, the coupling elements of which are said conductor sections; and

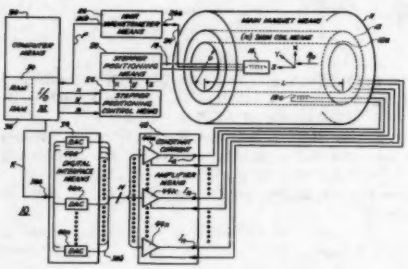
(d) means for reflecting the waves of the high-frequency field terminating the other ends of said conductors so that a high-frequency field oscillating in phase is formed by the tubular enclosure and the conductor sections which field is attenuated axially beyond said conductor sections.

4,680,551

METHOD FOR HOMOGENIZING A STATIC MAGNETIC FIELD OVER AN ARBITRARY VOLUME

Matthew O'Donnell, Schenectady; Steven G. Karr, Scotia; William D. Barber, Ballston Lake, all of N.Y.; Jish M. Wang, East Brunswick, N.J., and William A. Edelstein, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1985, Ser. No. 785,140
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 14 Claims



1. A method for minimizing the inhomogeneity of a static magnetic field, produced by a main magnet means, over a selected arbitrary volume, by operation of a plurality N of shimming coil means each independently an associated shimming magnetic field over that same volume, comprising the steps of:

(a) measuring the magnitude of the main magnet static field, in the absence of all shimming fields, at a plurality of locations X_i upon the surface of an imaginary sphere defined to enclose the arbitrary volume;

(b) measuring the magnitude and polarity of each of the N shimming fields, with respect to the magnitude and polarity of a DC current flowing through the associated shimming coil means, at the same plurality of locations X_i upon the imaginary sphere surface;

(c) determining the weighted mean-square error E of the total field, to the homogeneous field, at each of another plurality of points Y_i within the volume of said imaginary sphere; and

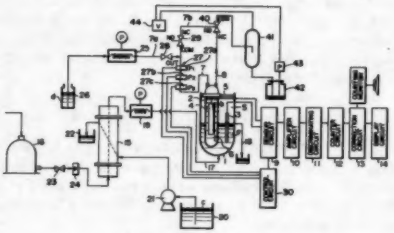
(d) selecting the magnitude and polarity of each current flowing through an associated one of the N shimming coils means to provide each of the N associated shimming fields with a magnitude and a polarity acting to substantially minimize the error E and the inhomogeneity of the main magnet field in the arbitrary volume.

4,680,552

APPARATUS FOR MEASURING IMPURITIES IN SUPER-PURE WATER WITHOUT EXPOSURE TO SURROUNDING ATMOSPHERE

Kozo Shirato, Omiya; Kazuo Hiraizumi, Narashino; Kazuyasu Kawashima, Yokohama; Shinya Okuyama; Masashi Kobayashi, both of Tokyo; Minoru Tanaka, Kawaguchi; Akira Takeya, Tokyo; Yoshio Yamamoto, Kawaguchi; Yasuo Koyama, Warabi; Satoshi Shinohara, and Toru Yunoki, both of Chigasaki, all of Japan, assignors to Erma Optical Works, Ltd., Tokyo and Ulvac Service Corporation, Kanagawa, both of, Japan

Filed Feb. 19, 1985, Ser. No. 702,641
Claims priority, application Japan, Nov. 21, 1984, 59-247535
Int. Cl.[4] G01N *27/02, 27/00, 27/28*
U.S. Cl. 324—439 4 Claims



1. An apparatus for measuring the impurities in super-pure water taken from a source of super-pure water without the super-pure water being exposed to the surrounding atmosphere prior to the measurement, said apparatus including

a sealed container which defines an interior space which is isolated from said surrounding atmosphere,

a sample supply means sealingly connected between said source of super-pure water and said sealed container so as to feed a sample mixture containing super-pure water into the interior space in said container,

an overflow pipe sealingly connected to said sealed container to remove excess sample mixture from the interior space in said container,

a sensor circuit,

a negtaive electrode located in the interior space in said sealed container and extending into the sample mixture in the interior space in said sealed container, said negative electrode being electrically connected to said sensor circuit,

a hollow sensor tube sealingly extending into the interior space in said container such that a lower end thereof is in said sample mixture, said lower end including a small hole therein,

a positive electrode located in said hollow sensor tube, said positive electrode being electrically connected to said sensor circuit,

means for applying a constant DC voltage through said negative and positive electrodes,

means for supplying an electrolyte to said hollow sensor tube to surround said positive electrode therein, and

means for removing the electrolyte from said hollow sensor tube.

4,680,553

INTERMEDIATE FREQUENCY AMPLIFIER WITH SIGNAL STRENGTH DETECTION CIRCUIT

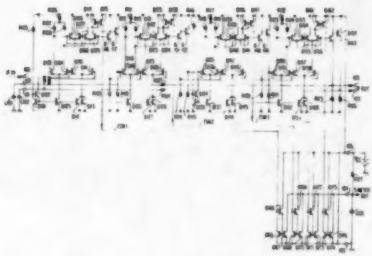
Katsuji Kimura; Yoshihiko Kasai, Asazawa; Hiroshi; Yukio Yokoyama, Sasaki; Yutaka; Koji Yamasaki, and Toshifumi Sato, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,831

Claims priority, application Japan, Jan. 18, 1985, 60-6844; Mar. 18, 1985, 60-55168; Apr. 9, 1985, 60-75133; Jul. 11, 1985, 60-153010; Jul. 18, 1985, 60-159364; Nov. 1, 1985, 60-245861; Nov. 1, 1985, 60-245862

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—2 11 Claims



1. An intermediate frequency amplifier stage, comprising: a plurality of intermediate frequency amplifiers each including a differential amplifier, a plurality of double balanced differential circuits individually coupled to input and output terminals of an associated differential amplifier in the intermediate frequency amplifier for full-wave rectifying the output of a corresponding intermediate frequency amplifier, and an adder circuit for adding rectification outputs of the respective double balanced differential circuits.

4,680,554

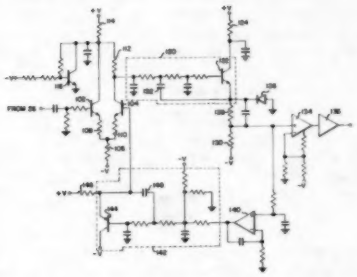
REAL TIME NETWORK RECEIVER SYSTEM FAST SETTLING AMPLIFIER

James K. Roberge, Lexington, Mass., assignor to Aetna Telecommunications Laboratories, Westboro, Mass.

Filed Sep. 25, 1985, Ser. No. 779,945

Int. Cl.[4] M03F *3/45, 1/34*

U.S. Cl. 330—260 11 Claims



1. A fast settling amplifier for recovering two level digital signals from a communication network comprising:

means for receiving dual level signals from a communication network;

means for amplifying said dual level signals about a reference signal level which reference signal level is representative of a point midway between said dual signal levels;

comparator means for providing said two level digital signals from said amplified dual level signal;

feedback path means responsive to the amplfied dual level signals for establishing said reference signal level including;

an integrator receiving said amplified dual level signal and providing an integrated amplified dual level signal; and

a feedback low pass filter receiving said integrated amplified dual level signal to remove signal ripple therefrom, and providing a signal to said means for amplifying at said reference signal level.

4,680,555

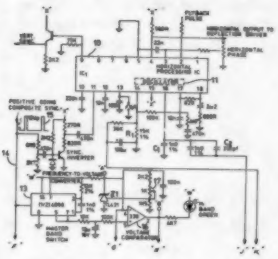
WIDE FREQUENCY RANGE, SWITCHED BAND-OSCILLATOR

Gerald Waldeck, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Jun. 30, 1986, Ser. No. 880,570

Int. Cl.[4] H03B *5/20*

U.S. Cl. 331—108 D 13 Claims



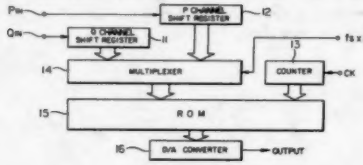
1. Apparatus for providing a wide frequency range, switched-band, output signal from an oscillator, said apparatus comprising: an oscillator including a network having first and second different types of impedances, said impedances determining the frequency of the output signal of said oscillator; means for switching into and out of said network additional impedance of said first type to switch between two bands of frequencies, an upper band and a lower band, said bands having an overlapping band of frequencies, said switching means comprising frequency-to-voltage converting means having an input terminal for receiving an input signal having a frequency within said wide frequency range and having an output terminal at which is provided an output signal having a magnitude that varies responsive to the frequency of said input signal, voltage comparator means for comparing the magnitude of said output signal of said converting means with the magnitude of a reference signal and producing a control signal having a certain characteristic when said output signal is of a magnitude indicative of said input signal having a frequency within said upper band and a characteristic different from said certain characteristic when said output signal is of a magnitude indicative of said input signal having a frequency within said lower band, switching between said control signals having different characteristics taking place within said overlapping band of frequencies, and means responsive to said control signal for adding or removing additional impedance of said first type to or from said network depending upon the characteristic of said control signal; and means for supplying said input signal to said oscillator.

4,680,556

DIGITAL MODULATION APPARATUS

Shigeki Nakamura; Makoto Ohnishi, both of Tokyo, and Yasufumi Takahashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,097
Claims priority, application Japan, Apr. 10, 1985, 60-74215
Int. Cl.[4] H03C 3/00
U.S. Cl. 332—16 R 3 Claims



1. A digital modulator comprising:

first means including memory elements for storing quantized values obtained by combining impulse responses from a roll-off filter which operates at a sampling frequency which is four times the frequency of a modulated carrier signal for a length of successive input data bits;

second means for determining an address, for a bit pattern associated with the bit length of the input data, indicating a content stored in said memory elements; and

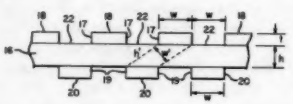
third means for effecting a D/A conversion on the quantized value obtained from said first means.

4,680,557

STAGGERED GROUND-PLANE MICROSTRIP TRANSMISSION LINE

Peter M. Compton, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 22, 1985, Ser. No. 725,450
Int. Cl.[4] H01P 3/08
U.S. Cl. 333—1 3 Claims



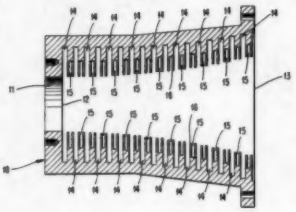
1. A transmission line for an electrical signal comprising a plurality of signal-carrying conductors having parallel edges disposed on one side of a strip of dielectric material, each of said conductors being spaced apart from each other across said strip by a spacing W between adjacent edges, a plurality of ground-plane conductors having parallel edges disposed parallel to said signal-carrying conductors and arranged on the opposite side of said strip in staggered relation with respect to said signal-carrying conductors such that each of said ground-plane conductors occupies a position corresponding to a location of one of said spacings between adjacent signal-carrying conductors, wherein the edges of each of the signal-carrying conductors are substantially congruent with the respective edges of the ground-plane conductors occupying said spacings on either side of each of said signal-carrying conductors.

4,680,558

CORRUGATED TRANSITION DEVICE FOR USE BETWEEN A CONTINUOUS AND A CORRUGATED CIRCULAR WAVEGUIDE WITH SIGNAL IN TWO DIFFERENT FREQUENCY BANDS

Subir Ghosh, and Aluízio P. Junior, both of Sao Paulo, Brazil, assignors to Telecomunicacoes Brasileiras S/A - Telebras, Brasilia, Brazil

PCT No. PCT/BR84/00007, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/02945, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 27, 1984, Ser. No. 776,167
Claims priority, application Brazil, Dec. 27, 1983, 8307286[U]
Int. Cl.[4] H01P 1/16, 5/08
U.S. Cl. 333—21 R 9 Claims



1. In a transition device operable in a first frequency band and a second, distinctly different frequency band comprising a waveguide having first and second ports and having a tapered interior boundary wall containing alternately positioned first and second type slots of distinct relative configuration aligned transverse to the axis of said waveguide, the improvement comprising: said first and second type slots each configured near said first port to have (i) respective first and second susceptances for signals in said first frequency band, which first and second susceptances are each non-zero and substantially equal in magnitude, with one of said first and second susceptances being capacitive and the other being inductive, and (ii) respective third and fourth susceptances for signals in said second, distinctly different frequency band, which third and fourth susceptances are each non-zero and substantially equal in magnitude, with one of said third and fourth susceptances being capacitive and the other being inductive, such that said first and second susceptances, in combination, and said third and fourth susceptances, in combination, provide respective and simultaneous high susceptance mutual resonance conditions between adjacent ones of said first and second type slots for said first and second frequency bands as are required for simultaneous matching of said device with a continuous waveguide at said first port, for signals in said first and second frequency bands.

4,680,559

RF SPLITTER CIRCUIT

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

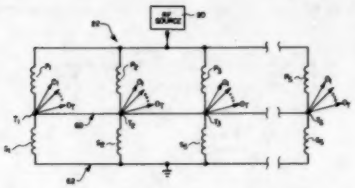
Filed Mar. 14, 1985, Ser. No. 711,627
Int. Cl.[4] H03H 7/48
U.S. Cl. 333—100 8 Claims

1. A signal splitter for supplying N load devices of varying impedances with N signals such that each of the N signals is of essentially the same magnitude and phase, said splitter including:

a plurality of S step-down transformers, each transformer having a primary winding and a secondary winding which is series connected between a common signal source and ground,

each said transformer having an output terminal located at the junction interconnecting its primary and secondary windings,

each junction being interconnected together in common with the other junctions such that all of said primary windings are in parallel to each other and all of said secondary windings are in parallel to each other,



each said junction providing an output terminal having T outputs connected thereto so that said splitter has N total outputs, where N=ST, for driving N load devices.

4,680,560

ELECTRICAL FILTER DEVICE

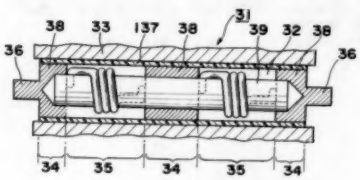
Tadahiro Yorita; Haruo Matsumoto, both of Kanazawa, and Itsuo Nakatsuji, Ishikawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 26, 1986, Ser. No. 844,469

Claims priority, application Japan, Apr. 3, 1985, 60-70395; Sep. 25, 1985, 60-211891

Int. Cl.[4] H01P *1/205, 1/202;* **H03H** *7/01*

U.S. Cl. 333—206 **10 Claims**



1. In an electrical filter device which comprises a casing, filter elements in said casing, and input and output ports mounted on an outer wall of said casing, with said input and output ports being electrically connected to said filter elements, the improvement comprising

at least one axial low-pass filter provided between said filter elements and one of said input and output ports, said axial low-pass filter further including

an outer conductor having an axial bore,

a plurality of capacitors arranged in said bore at predetermined intervals, each capacitor utilizing said outer conductor as an outer capacitor electrode, having an intermediate dielectric member with a cylindrical cross section, and having a conductive inner capacitor electrode,

said inner capacitor electrodes of said capacitors being mounted at said predetermined intervals on an insulating axis member with spaces being defined therebetween, and

at least one inductor mounted on said axis member in a space between a pair of adjacent said inner capacitor electrodes, and electrically connected to said pair of inner capacitor electrodes.

4,680,561

MICROWAVE WAVEGUIDE FILTER HAVING A METAL PLATE WHICH INCLUDES A RESONANT APERTURE THEREIN

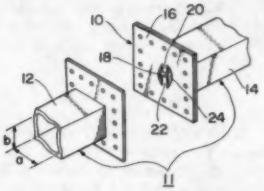
Tadao Shirai, Tokyo, Japan, assignor to Nec Corporation, Japan

Filed May 29, 1985, Ser. No. 738,952

Claims priority, application Japan, May 30, 1984, 59-110160

Int. Cl.[4] H01P *1/212*

U.S. Cl. 333—208 **3 Claims**



2. A microwave filter for use in a rectangular waveguide, said filter comprising:

a plate member of electrically conductive material, said plate having a thickness less than one-tenth of the wavelength of a frequency to be suppressed,

said plate defining a circular opening having a diameter which is less than the length of the short side of said rectangular waveguide, and

said plate further having two opposed projections which extend inwardly, from diametrically opposing positions on the circumference of said circular opening, toward the center of said opening, the ends of said projections defining a gap therebetween at the center of the circle,

said plate member being arranged in said rectangular waveguide, parallel with the electric field in the waveguide and normal to the magnetic field in the waveguide.

4,680,562

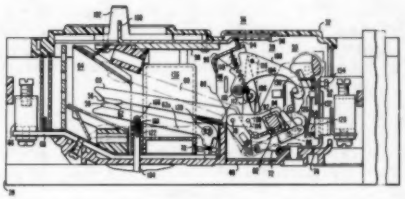
INTEGRAL CIRCUIT INTERRUPTER WITH SEPARABLE MODULES

Walter V. Bratkowski, McKeesport, and John A. Wafer, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1985, Ser. No. 759,719

Int. Cl.[4] H01H *77/06*

U.S. Cl. 335—16 **5 Claims**



1. A circuit breaker comprising:

an electrically insulating housing;

a circuit breaker within the housing and including first and second separable contacts operable between open and closed contact positions;

the circuit breaker including a releasable lever movable when released to a tripped position to effect automatic opening of the contacts in response to a first predetermined current condition;

the circuit breaker also including a current detector for monitoring said first predetermined current condition and

for automatically tripping the releasable lever in response to said first predetermined overcurrent condition;

the first contact being mounted on a first movable contact carrying armand coupled to the releasable lever;

the second contact being mounted on a second contact carrying arm being movable between open and closed positions;

electromagnetic actuating means for moving the second contact arm between said open and closed positions;

modular sensor means for monitoring current flow and for automatically actuating only the electromagnetic means in response to a second predetermined current condition and the modular sensor means being removably mounted and replaceable by modular sensor means of different current ratings.

4,680,563

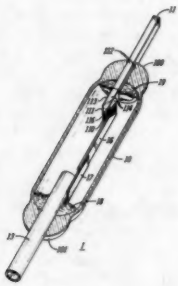
RELAY SWITCH APPARATUS

James T. Hanlon, Worthington, Ohio, and Paul W. Renaut, Lee's Summit, Mo., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1986, Ser. No. 837,069

Int. Cl.[4] H01H *1/08, 29/00*

U.S. Cl. 335—58 **11 Claims**



1. A mercury switch construction (1) comprising contact structures (11, 13) oppositely supported in an envelope member (10) with free ends thereof positioned to engage each other

CHARACTERIZED IN THAT

said contact structures comprises

means (11) extending into the envelope member and having a mercury-wetted surface (113) located along one side thereof and having an opening (111) at a free end positioned inside the envelope member extending from said mercury-wetted surface through said means for forming a mercury contact (117) at a surface of said means opposite said mercury-wetted surface.

4,680,564

MULTI-POLE MOLDED CASE CIRCUIT BREAKER WITH A COMMON CONTACT OPERATING CROSSBAR MEMBER

Bernard DiMarco, Lilburn, Ga., and Charles W. Stanford, Bellefontaine, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Oct. 1, 1984, Ser. No. 656,233

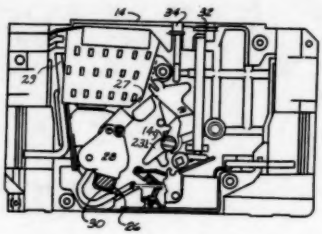
Int. Cl.[4] H01H *73/02*

U.S. Cl. 335—16 **9 Claims**

1. A multi-pole circuit breaker, comprising:

a first pole having a molded housing containing a frame mounted on the housing, a handle assembly mounted on the frame with a handle protruding through an opening in the housing and operable between an ON position and an OFF position, a fixed contact, a movable contact operable between an open position and a closed position, a linkage assembly connecting the movable and the handle assembly for movement of the contacts between the closed and open positions in response to movement of the handle between the ON and OFF positions, and a tripping mechanism having a tongue protruding through an opening in the housing;

a second pole having a molded housing containing a fixed



contact, a movable contact operable between an open position and a closed position, a tripping mechanism with groove accessible through an opening in the housing and being mateable with said tongue; and

a crossbar member connecting the movable contacts of the first and second poles, said contacts moving in unison with the crossbar in response to actuating the tripping mechanism.

4,680,565

MAGNETIC FIELD DEVICE FOR A SYSTEM FOR THE ACCELERATION AND/OR STORAGE OF ELECTRICALLY CHARGED PARTICLES

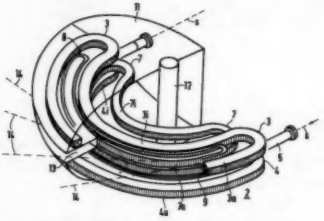
Andreas Jahnke, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,495

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522528

Int. Cl.[4] H01F *7/22*

U.S. Cl. 335—216 **8 Claims**



1. A magnetic-field device for a system for at least one of the acceleration and storage of electrically charged particles, particularly electrons, the particle trajectory of which has curved sections, and having an appropriately curved dipole magnet having a concave section and a convex section, the dipole magnet comprising superconducting windings for generating a magnetic guiding field for the particle beam which has a weakly focusing effect due to field gradients thereof, each dipole magnet being at least largely free of iron and having associated therewith a superconducting supplemental winding, said superconducting supplemental winding being curved to match said superconducting windings of said dipole magnet, and having a convex section which adjoins a region of the concave sections of the curved windings of the dipole magnet,

whereby the required field gradients can substantially be generated.

4,680,566

COIL WITH MAGNETISABLE ROD CORE

Walter Goseberg, and Alfred Pollack, both of Hanover, Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,967

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3429976; Jul. 18, 1985, 3525649

Int. Cl.[4] H01F *27/28, 27/34*

U.S. Cl. 336—181 **9 Claims**

1. In a coil with a magnetisable rod core having three adjacent coaxially positioned windings distrubuted roughly uniformly with respect to said rod core, and in which the two outer windings have approximately equal numbers of turns, the improvement wherein: said rod core is immovably positioned so that it is fully immersed in the third centre winding and at least partially immersed in said outer windings so that said outer windings have approximately equal inductances; said outer windings are connected in series opposition such that when an alternating voltage is applied across said outer windings, their magnetic fields in said rod core are mutually opposed, whereby the mutual coupling between said centre wwinding and said series connected outer windings is minimized; said centre winding of a of is the primary or secondary winding of a line drive transformer and is conductively isolated from said outer windings; a further winding forming the other of said secondary or primary windings of said transformer is disposed only above said centre winding; and said outer windings which are connected in series are arranged as a vertical integration coil for a television apparatus.

4,680,567

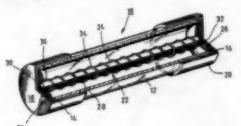
TIME DELAY ELECTRIC FUSE

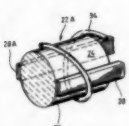
Carl H. Edwards, Elizabethtown, Ky., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 10, 1986, Ser. No. 827,575

Int. Cl.[4] H01H *85/04*

U.S. Cl. 337—164 **8 Claims**





1. A time delay fuse comprising:

an insulative housing including first and second ends, first and second electrically conductive ferrules attached on said first and second ends of said housing, respectively.

a fuse element including in combination, an elongated substantially straight electrically insulated core within said housing, at least one substantially straight, flat, wire extending along the external length of said core, a second longer wire being supported by said core and engaging said straight wire so as to establish a plurality of point contacts between said straight wire and said longer wire, and

said straight and longer wires each being electrically connected in series with said conductive ferrules, said straight and longer wires each having a first end and a second end, wherein said first end of said straight wire and said first end of said longer wire each being electrically connected to said first ferrule and wherein said second end of said straight wire and said second end of said longer wire each being electrically connected to said second ferrule.

4,680,568

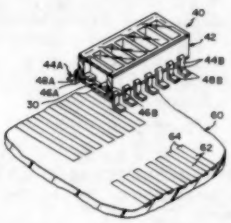
ELECTRICAL COMPONENT HAVING FUSE ELEMENT, AND METHOD OF USING SAME

Mark Corrao, Wyoming, Mich., and David T. Shaffer, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 29, 1986, Ser. No. 857,204

Int. Cl.[4] H01H *85/02, 85/14*

U.S. Cl. 337—186 **10 Claims**



1. An electrical component mountable to an electrical article to complete at least one of a plurality of circuit paths thereon, comprising:

a housing means;

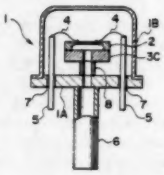
a like plurality of pairs of opposing contact means secured in said housing means, each of said contact means having an outer contact section extending outwardly from said housing means and matable to a corresponding contact means of said article and further havng an innner contact section spaced from the inner contact section of the associated other of said contact means; and

a fuse element associated with each said pair of contact means mechanically and electrically secured to and between said inner contact sections thereof, the fuse element between the inner contact sections of at least a selected one of said pairs of contact means having been opened by being melted by a selected programming current applied to said at least one selected pair of contact means prior to mounting to said electrical article to retain the associated at least one said circuit path in an open condition, whereby said component is programmed, and said article is programmed by said component mounted thereto.

4,680,569
SEMICONDUCTOR PRESSURE SENSOR

Bunshiro Yamaki, Fujisawa; Sadatake Kikuchi, Hyogo, and Yutaka Tomisawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 27, 1984, Ser. No. 654,940
Claims priority, application Japan, Sep. 30, 1983, 58-180440
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—42 10 Claims

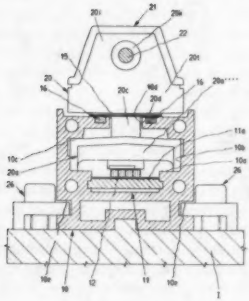


1. A semiconductor pressure sensor comprising:
a hollow shell comprising a mount plate having a bore provided therethrough and a cap fixed on the mount plate;
a pressure inlet tube fixed to the mount plate and projecting toward the outside of the shell;
the pressure inlet tube communicating with the bore;
a semiconductor chip received within said shell, said semiconductor chip being provided with a thin diaphragm portion in which a strain gauge is formed;
a base member on which said semiconductor chip is mounted, said base member having a coefficient of thermal expansion similar to that of said semiconductor chip; and
a thin tubular supporting member to which said base member is fixed, said thin tubular supporting member communicating with said bore and having a coefficient of thermal expansion similar to that of said semiconductor chip;
said base member being bonded to said thin tubular supporting member by a soft solder material, and said thin tubular supporting member being bonded to said mount plate by a hard solder material.

4,680,570
LINEAR POTENTIOMETER FOR MEASURING TRAVEL

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lossburg 1, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 857,956
Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3115880; Oct. 5, 1985, 3535587
Int. Cl.[4] H01C *10/38*
U.S. Cl. 338—176 11 Claims

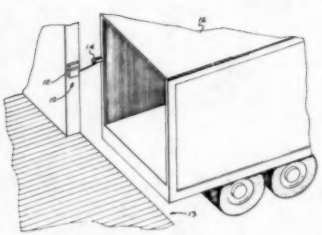


1. A linear potentiometer for measuring the relative movement between two component parts comprising in combination:
an elongated housing in the form of a metal tubular profiled member of approximately rectangular cross section which is securable to one of the component parts, said housing having a longitudinal slit disposed symmetrically with respect to a vertical plane of symmetry in its upper horizontal wall, a plurality of guide shoulders formed in the inner surface of each of its side walls, and a plurality of permanent magnets disposed on the upper surface of said upper wall adjacent said slit;
a covering band of spring steel, which rests on said upper surface of said upper wall of said housing to cover said longitudinal slit and is normally retained there by said permanent magnets;
a molded integral slide formed of a high polymer plastic and connectable via a joint to the other of the component parts, said slide being movable along the length of said housing and including a pair of spaced horizontal guide ribs slidably supported on said guide shoulders of said housing and connected together via a slide body portion having a middle section whose upper end extends through said longitudinal slit and above said upper wall and there forms a horizontal anchoring plate which extends cross wise symmetrically to said vertical plane of symmetry, a joint chamber defined by a plurality of vertical walls, at least one of which extends transverse to said plane of symmetry, molded onto the upper surface of said anchoring plate, and at least one opening for said covering band extending through said anchoring plate with said opening being defined on one side by said one wall of said chamber and on its opposite side by a region of said anchoring plate corresponding to said middle section of said slide body portion, said covering band extending through said opening and over said region of said anchoring plate;
a wiper for a resistance element mounted on the lower end of said slide body portion beneath said region of said anchoring plate; and
an elongated resistance element disposed within said housing beneath said slit and said wiper.

4,680,571
TRAILER CREEP ALARM

Ronald Keklak, Amston, Conn.; Michael V. Couture, Holyoke, Mass.; John C. Whitehouse, Winsted, Conn., and Marshall W. Payne, Chicopee, Mass., assignors to Dedicated Technologies, Inc., Springfield, Mass.

Filed Mar. 13, 1985, Ser. No. 711,447
Int. Cl.[4] B60Q *1/00*; G08B *21/00*
U.S. Cl. 340—52 R 27 Claims



1. A creep alarm comprising:
(a) an outer housing that is adapted to be fastened onto a wall at a loading dock;
(b) a clamp that is magnetically held against the outside of the housing and which can be removed for quick attachment to a nearby trailer or truck;
(c) said clamp being connected to a free end of a spring-ten-

sioned, retractable cord that is spool fed from inside the housing;

(d) a spring-loaded spool assembly that is rotatably mounted within the housing for windingly storing the cord;

(e) means for automatically arming the alarm in a "ready" position after the clamp and cord have been drawn away from the housing and clamped onto the trailer or truck and a preset delay has occurred, wherein the arming means comprises a spring-biased actuating arm that is rotatably mounted within the housing, adjacent to the spool assembly, said arm having a flange that is adapted to extend through a vertical slot in the housing, whereby said flange is normally abutted by the clamp, when the clamp is magnetically held against the housing, to prevent the arm from rotating and accidentally arming the alarm; and,

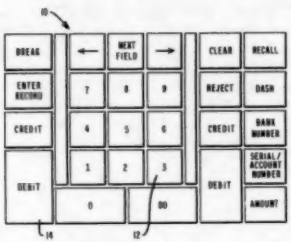
(f) triggering means for automatically turning on an electrically operated horn inside the housing if the cord is subsequently tugged a preselected amount after the clamp and cord have been drawn away from the housing and the alarm has been armed.

4,680,572

CHORD ENTRY KEYING OF DATA FIELDS

Patrick G. Meguire, Ithaca, and Thomas J. Pitoniak, Trumansburg, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 14, 1981, Ser. No. 330,639
Int. Cl.[4] H04Q *4/00*; G06F *3/02*
U.S. Cl. 340—365 R **12 Claims**



1. A keyboard system having a plurality of data keys and function keys arranged in a manner to be operated by one or both hands, and logic means permitting chord entry keying of characters into the keyboard upon substantially simultaneous depression of more than one key of the keyboard wherein data is entered upon depression of one or more data keys and upon depression of a function key within a predetermined time frame prior to or after the depression of the last data key.

4,680,573

INTRUSION WARNING WIRE FENCE

Jacques Ciordinik, Bologna, and Alessandro Penzo, Crespellano, both of Italy, assignors to CI.K A.RA S.p.A., Bologna, Italy

Continuation of Ser. No. 407,731, Aug. 12, 1982, abandoned.
This application Oct. 22, 1985, Ser. No. 790,310
Claims priority, application Italy, Aug. 19, 1981, 12606 A/81
Int. Cl.[4] G08B *13/00, 13/18*
U.S. Cl. 340—541 **6 Claims**

1. An intrusion warning wire fence comprising:

(a) at least one tubular wire helically coiled in the shape of a concertina wire;

(b) at least one energy conductor loosely contained within a lumen of said tubular wire;

(c) a warning system responsive to any variation of conduction capability of said at least one conductor;

(d) notch or groove means extending transversely to and weakening said tubular wire;

(e) barbed means on said tubular wire; and

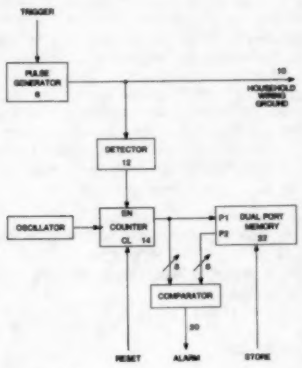
(f) two inclined V-arranged arms for supporting said wire therebetween, said arms being directed inward and outwards of a fence and mounted on tops of posts arranged between sections of said fence.

4,680,574

APPLIANCE ANTI-THEFT CIRCUITRY

Bryan J. Ruffner, 2818 N. 24th St., Arlington, Va. 22207

Filed Mar. 22, 1985, Ser. No. 717,128
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 **6 Claims**



1. An alarm device for detecting the removal of an electrical apparatus when plugged into a three-terminal power-supply outlet having a hot terminal and electrically interconnected neutral and grounded terminals where said alarm device comprises:

circuitry for cyclically applying a voltage across said neutral and grounded terminals;

circuitry for timing the return of an inverted electrical reflection of said applied voltage caused by the point of interconnection of said interconnected neutral and grounded terminals;

circuitry for electrically storing the measured time of said inverted electrical reflection;

circuitry for comparing a stored value of said measured time with subsequent values of said measured time;

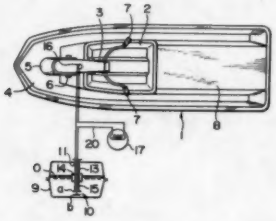
and circuitry for generating an alarm signal when a stored value of said measured time and a subsequent value of said measured time differ by more than a predetermined amount.

4,680,575

LIQUID LEVEL DETECTING DEVICE

Mitsuhiro Yazaki, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1984, Ser. No. 686,676
Claims priority, application Japan, Dec. 28, 1983, 58-202321[U]
Int. Cl.[4] G08B *21/00*; H01H *35/18*
U.S. Cl. 340—624 1 Claim



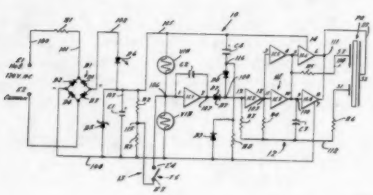
1. In a boat having an engine, the combination comprising:
a generator driven by the engine,
a tank for engine liquid,
a liquid level detecting device including a float provided within said tank,
a liquid level detecting switch operated by said float and turned on when the liquid level drops to a preset level, said liquid level detecting switch comprising fixed electrical contact means and flexible electrical contact means which close the circuit under the weight of said float when the liquid level drops to said preset level,
a liquid level warning means connected in series with said switch, and
circuit means free of a central switch connecting said series connected liquid level detecting switch and warning means to a power supply provided exclusively by said generator of said engine for providing a low engine liquid level warning while the engine is operating.

4,680,576

PHOTOELECTRIC SMOKE DETECTOR AND ALARM SYSTEM

Frederick T. Bauer, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

Filed Nov. 29, 1982, Ser. No. 445,083
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—630 4 Claims



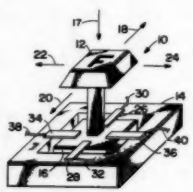
1. In a smoke detector and alarm system, the combination including housing means defining a light tight interior chamber, said housing means having an inlet opening and an outlet opening each communicating with said interior chamber, means in said housing means including a plurality of baffles defining a tortuous passageway preventing the passage of ambient light into said interior chamber while permitting air and airborne particulate matter contained therein to flow into said interior chamber from said inlet opening and out of said interior chamber through said outlet opening, piezoceramic electrically activatable alarm means carried by said housing means, an illuminating circuit including a gallium aluminum arsenide light emitting diode mounted in said interior chamber, means providing a direct current supply for said light emitting diode, a smoke sensing circuit including dual photoelectric means formed on the same substrate and the electrical conductivity of each of which varies as a function of the amount of light impinging thereon, said dual photoelectric means being connected in series and being electrically connected to said means providing a direct current supply for said light emitting diode, means mounting said dual photoelectric means in said interior chamber in proximity to said light emitting diode whereby light emanating from said light emitting diode impinges upon one of said dual photoelectric means at all times and impinges upon the other of said dual photoelectric means to change the conductivity of said dual photoelectric means when airborne particulate matter is present in said interior chamber, and means activatable in response to a differential in the conductivity of said dual photoelectric means for activating said piezoceramic alarm means.

4,680,577

MULTIPURPOSE CURSOR CONTROL KEYSWITCH

David H. Straayer; Patrick J. Franz, both of Colton, and Eugene F. Lynch, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 555,792, Nov. 28, 1983, abandoned.
This application Apr. 18, 1986, Ser. No. 854,687
Int. Cl.[4] H01H *25/00*
U.S. Cl. 340—711 11 Claims



1. A keyboard system for operator entry of characters and control functions to a computer and computer display or the like, said keyboard system comprising:
a plurality of, finger tip sized, alpha-numeric character keys organized in a preset pattern wherein:
each key includes a vertically displaceable key cap having a corresponding alpha-numeric designation assigned thereto, and detection means coupled thereto for detecting vertical displacement of the key; and
at least one of said plurality of alpha-numeric keys includes mounting means for permitting lateral motion in any direction, and for said at least one alpha-numeric key the corresponding detection means also detects lateral displacement thereof; and
processor means coupled to the individual detection means of each of said plurality of alpha-numeric character keys for intitiating a signal corresponding to the alpha-numeric designation assigned to any key for which vertical displacement was detected, and for intitiating cursor control signals to position the cursor on the computer display in response to lateral displacement of such a key.

4,680,578

BASELINE TRANSPOSITION AND CHARACTER SEGMENTING METHOD FOR PRINTING

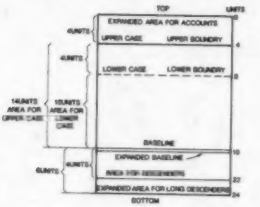
Klaus-Juergen Hornig, Sulzbach, and Hans-Henning Thiessen, Kelkheim, both of Fed. Rep. of Germany, assignors to Mergenthaler Linotype GmbH, Eschborn, Fed. Rep. of Germany

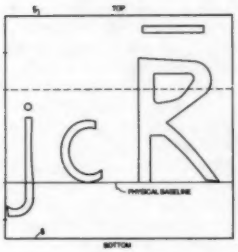
Filed May 17, 1984, Ser. No. 611,563

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317842

Int. Cl.[4] G09G 1/06

U.S. Cl. 340—731 4 Claims





1. A method for imaging a master encoded character, having an encoded character physical baseline and a fixed size, on a display having a fixed size at a pre-determined size larger than said display size in a first dimension, comprising the steps of:

identifying characters for imaging on said display, at a size larger than the said display size and extending beyond the limits of the maximum size of said display in said first dimension,

identifying point data at specified locations in the encoded data defining the character relative to the encoded character physical baseline for dividing the encoded character into encoded separate sections, whereby each of said encoded separate sections is to be of a size no greater than said display size in said first dimension when said encoded separate sections are displayed;

identifying a location in said separate encoded sections for inserting an encoded logical baseline and referencing said encoded logical baseline for said encoded separate sections to said encoded character physical baseline,

referencing said encoded character physical baseline and said encoded logical baseline to a respective display physical baseline and referencing said respective display physical baseline to its projection in an imaging surface movable relative to said display, and

moving said imaging surface to locate the respective logical baselines for said separate encoded sections projected onto said imaging surface in the same relative relationship to the projection of said encoded character physical baseline on said imaging surface as said encoded logical baselines as to said encoded character physical baseline.

4,680,579

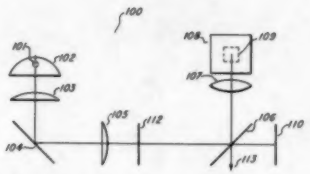
OPTICAL SYSTEM FOR PROJECTION DISPLAY USING SPATIAL LIGHT MODULATOR DEVICE

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1983, Ser. No. 530,327

Int. Cl.[4] G09G 3/34

U.S. Cl. 340—783 16 Claims



1. An electronic display device comprising:

a light source;

a first optical system for forming a substantially collinear beam of light from said light source;

a Schlierin optical device having alternating reflecting and transmitting portions for forming respective reflecting and transmitting optical paths, said Schlierin optical device disposed to receive light from said first optical system at an angle;

a second optical system disposed to receive light from one of said reflecting or transmitting optical paths of said Schlierin optical device for focusing light received from said Schlierin optical device to a focal point;

a deformable mirror device disposed near said focal point for receiving light from said source optical system, said deformable mirror device having a matrix of a plurality of individually electrically deformable mirror cells, each mirror cell normally reflecting light received from one type of said reflecting and transmitting portions of said Schlierin optical device back to similar type portions and being electrically deformable to reflect at least some light received from one type of said reflecting and transmitting portions of said Schlierin optical device back to another type of said reflecting and transmitting portions of said Schlierin optical device;

a nonreciprocal optical device disposed between said light source and said Schlierin optical device for transmitting more light from said light source to said Schlierin optical device than reflected back to said light source and for reflecting more light back to said Schlierin optical device than transmitted from said Schlierin optical device to said light source; and

a viewing screen disposed for receiving light reflected by deformed mirror cells of said deformable mirror device.

4,680,580

ACTIVE MATRIX-ADDRESSED LIQUID-CRYSTAL DISPLAY DEVICE

Yukito Kawahara, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 18, 1983, Ser. No. 467,799

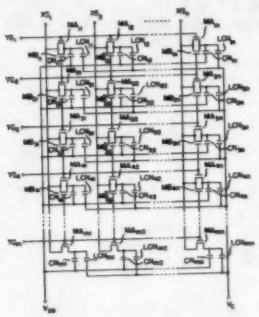
Claims priority, application Japan, Feb. 23, 1982, 57-27588

Int. Cl.[4] G09G 3/36

U.S. Cl. 340—784 20 Claims

1. An active matrix-addressed liquid-crystal display device comprising: a semiconductor substrate, a transparent substrate, and a liquid crystal sandwiched between said semiconductor substrate and said transparent substrate, said semiconductor substrate comprising matrix liquid-crystal driving cells each comprised of a capacitor for holding a signal voltage to drive the liquid crystal, an electrode for driving the liquid crystal corresponding to a unit picture element, and a switching element having a gate for addressing each of the picture elements,

column electrodes to apply a signal voltage for driving the liquid crystal, and row electrodes for scanning the gates to



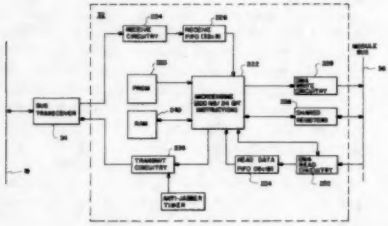
address said switching elements, wherein said switching elements belonging to some of the rows comprise MOS transistors connected in parallel to different row electrodes.

4,680,581

LOCAL AREA NETWORK SPECIAL FUNCTION FRAMES

Tony J. Kozlik, and Bruce J. Landini, both of Phoenix, Ariz., assignors to Honeywell Inc., Phoenix, Ariz.

Filed Mar. 28, 1985, Ser. No. 716,912
Int. Cl.[4] H04Q *9/00;* **G05B** *23/02;* **H04J** *6/00*
U.S. Cl. 340—825.06 **5 Claims**



1. In a local area network having a plurality of nodes (16) wherein the local area network utilizes a token passing scheme for communicating between nodes (16), each node (16) having an interface apparatus (32, 34) which operates independently of a processor (38) associated with said node (16), each node (16) being capable of operating in an on-line mode and an off-line mode, wherein a node (16) in the off-line mode is responsive to a message frame identified as a special function frame, the special function frame containing diagnostic-type commands which are to be performed by the node (16) in the off-line mode, and further wherein the node (16) in the off-line mode does not participate in normal communications of the local area network including the token passing or the receiving of information frames, a method of diagnosing and recovering a second node (16) from a first node (16), the method implemented by the second node (16) comprising the steps of:

(a) waiting (101, 105, 110) to receive the message frame addressed to the second node (16);

(b) determining (115) if the message frame is a special function frame, and if the message frame is determined to be the special function frame;

(c) insuring (120, 125, 135) that the node is in an off-line mode;

(d) determining (130, 140, 150, 155, 160, 165, 170, 175, 180, 185) the type of special function frame to perform the command specified by the type of special function frame, the function performed being monitored and analyzed by the first node (16) to determine and diagnose fault conditions of the second node (16); and

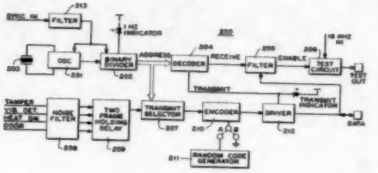
(e) returning to the step of waiting of step (a).

4,680,582

INFORMATION REPORTING MULTIPLEX SYSTEM

Ezequiel Mejia, Longuevil, Canada, assignor to Honeywell Ltd., Scarborough, Canada

Filed May 20, 1981, Ser. No. 265,478
Claims priority, application Canada, Jul. 15, 1980, 356261
Int. Cl.[4] G08B *5/24*
U.S. Cl. 340—825.17 **28 Claims**



1. A system for reporting information comprising:

a plurality of remote stations each connected to at least one sensor and having a synchronization terminal for receiving periodic synchronization signals, a time slot generator connected to synchronization terminal for supplying an enabling signal at a predetermined amount of time after receiving a synchronization signal wherein the time slot for each station occurs at a substantially different time after receipt of a synchronization signal, a data terminal, and a transmit circuit connected to said time slot generator and to said sensor for supplying information derived from said sensor to said data terminal upon receiving said enabling signal;

a master station having a synchonization generator, a synchronization terminal connected to said synchronization generator for receiving synchronization signals therefrom, a data terminal, and information receiving means connected to said data terminal of said master station for receiving said information supplied by said plurality of remote stations; and,

communication means interconnecting said data terminals and said synchronization terminals of said master station and said plurality of remote stations.

4,680,583

TERMINAL ADDRESS ASSIGNMENT IN A BROADCAST TRANSMISSION SYSTEM

Wayne D. Grover, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 1, 1985, Ser. No. 697,543
Int. Cl.[4] H04Q *3/00;* **G05B** *23/02;* **H04V** *3/24*
U.S. Cl. 340—825.52 **11 Claims**

1. A method of assigning addresses to a plurality of terminals in a broadcast transmission system in which in normal operation messages and said addresses are transmitted between a master station and said terminals, the method comprising the steps of:

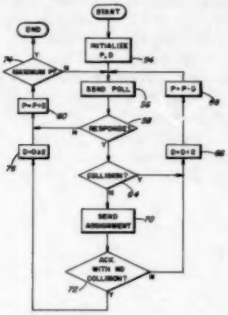
(a) transmitting from the master station a general polling message to which any terminal may respond;

(b) trasmitting a response from each terminal which receives the general polling message and which does not have an assigned address;

(c) varying at the master station at least one parameter which affects the bit error rate of the terminals;

(d) repeating steps (a) to (c) until the master station receives only one response, whereby one terminal is isolated;

(e) transmitting an assigned address from the master station to the isolated terminal; and



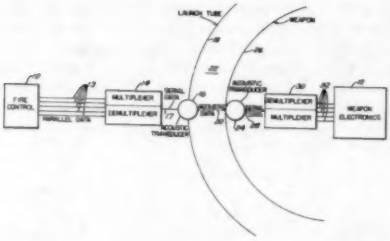
(f) repeating steps (a) to (e) until each of the terminals has an assigned address.

4,680,584

ACOUSTIC PRELAUNCH WEAPON COMMUNICATION SYSTEM

Steven S. Newsom, Middletown, R.I., and James M. McCarthy, Mattapoisett, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,024
Int. Cl.[4] F42B *19/10*; G08C *19/10*; H04B *11/00*
U.S. Cl. 340—850 **2 Claims**



1. An acoustic prelaunch weapon communication system for providing information between a fire control system and a launchable underwater weapon electronic system comprising:

first multiplexing means adapted to receive parallel data electrical signals from said fire control system for converting said parallel data electrical signals to serial data multiplexed electrical signals, said first multiplexing means further comprises first parallel electrical lines connected to said fire control system and a first multiplexer/demultiplexer unit connected to said first parallel electrical lines;

a launch tube;

first acoustic transducer means mounted on a wall of said launch tube and connected to receive said serial data multiplexed electrical signals for converting said serial data electrical signals to acoustic data signals and transmitting said acoustic data signals, said first acoustic transducer means further comprises a first serial electrical line connected to said first multiplexer/demultiplexer unit and a first acoustic transducer connected to said first serial electrical line;

a launchable underwater weapon;

a cavity adapted to contain seawater located between and separating said launch tube and said launchable underwater weapon;

second acoustic transducer means mounted to the shell of said launchable underwater weapon and connected to receive said acoustic data signals from said first acoustic transducer means for converting said acoustic data signals to serial data multiplexed electrical signals, said second acoustic transducer means further comprises a second acoustic transducer and a second serial electrical line connected to said second acoustic transducer;

second multiplexing means located within the shell of said launchable underwater weapon and connected to receive said serial data multiplexed electrical signals and for demultiplexing said serial data multiplexed electrical signals and converting them to parallel data signals and adapted to provide said parallel data signals to said launchable underwater weapon electronic system, said second multiplexing means further comprises a second multiplexer/demultiplexer unit connected to said second serial electrical line and second parallel electrical lines connected between said second multiplexer/demultiplexer unit and said launchable underwater weapon electronic system, said second multiplexing means further adapted to receive parallel data electrical signals from said launchable underwater electrical signals from said launchable underwater weapon electronic system for converting said parallel data electrical signals to serial data multiplexed electrical signals;

said second acoustic transducer means connected to receive said serial data multiplexed electrical signals from said second multiplexing means for converting said serial data electrical signals to acoustic data signals and transmitting said acoustic data signals;

said first acoustic transducer means connected to receive said acoustic data signals from said second acoustic transducer means for converting said acoustic data signals to serial data multiplexed electrical signals; and

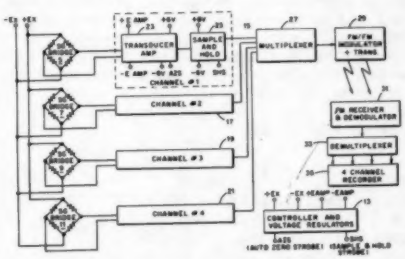
said first multiplexing means connected to receive said serial data multiplexed electrical signals from said first acoustic transducer means and for demultiplexing said serial data multiplexed electrical signals and converting them to parallel data multiplexed signals and adapted to provide said parallel data multiplexed signals to said fire control system.

4,680,585

PULSE-EXCITED, AUTO-ZEROING MULTIPLE CHANNEL DATA TRANSMISSION SYSTEM

George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 22, 1985, Ser. No. 704,114
Int. Cl.[4] G01C *15/08*
U.S. Cl. 340—870.13 **3 Claims**



1. A multiple channel data transmission system, comprising:

a plurality of data channels, each channel including a trans-

ducer for generating an output signal proportional to a variable to be measured in response to the application of a transducer excitation pulse thereto, a transducer amplifier means for amplifying the output of said transducer in response to the application of an amplifier excitation pulse, a sample-and-hold circuit means for sampling and holding the output level of said amplifier means in response to a sample-and-hold strobe pulse applied thereto and an auto zeroing means for nulling the output of said amplifier means in response to an auto zero strobe pulse applied thereto;

a control means for cyclically generating at a selected cycle rate said transducer excitation pulse, said amplifier excitation pulse, said sample-and-hold strobe pulse and said auto zero strobe pulse so that said amplifier means is excited for a preselected period during which said auto zero strobe pulse is generated followed by said transducer excitation pulse and said sample-and-hold strobe pulse is generated during said transducer excitation pulse so that the value stored by said sample-and-hold circuit means is updated during each cycle of said control means, thereby producing pseudo-continuous outputs from said sample-and-hold circuit means of each of said plurality of data channels;

a transmitter means including a multiplexer means for continuously sampling said pseudo-continuous outputs of each of said data channels and multiplexing said signals onto a a single channel to produce a modulated signal to be transmitted; and

a receiver means for receiving said modulated signal.

4,680,586

GENERATOR CAPABLE OF PRODUCING MULTIPLE SIGNALS WITH DIFFERENT FREQUENCIES AND A TRANSMITTER WHICH INCLUDES A SIGNAL GENERATOR OF THIS KIND

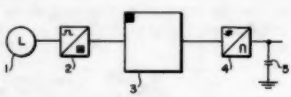
Patrick Marchand, Fraconville, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Sep. 24, 1985, Ser. No. 779,672

Claims priority, application France, Sep. 26, 1984, 84 14784

Int. Cl.[4] G08C *19/26*

U.S. Cl. 340—870.26 **6 Claims**



1. Signal generator apparatus comprising a memory having storage locations storing, in digital form, successive samples of the amplitude of the sum of a multiple number of analog signals of different predetermined frequencies, said frequencies being selected such that said samples collectively correspond to a different integer number of cycles for each of said signals, address counter means connected to said memory for successively addressing said storage locations, a clock connected to control said address counter means, digital-to-analog converter means connected to said memory for converting said samples into an analog signal which is substantially equivalent to said sum of said signals, and capacitative smoothing means connected to the output of said digital-to-analog converter means for smoothing the analog signal output of said digital-to-analog converter means.

4,680,587

INSTRUMENT LANDING SYSTEM

John P. Chisholm, Olympic Valley, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

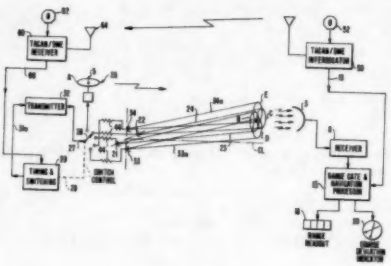
Filed Aug. 14, 1985, Ser. No. 765,490

Int. Cl.[4] G01S *13/86*

U.S. Cl. 342—33 **9 Claims**

1. An improved landing system for landing an aircraft along a preferred landing guidance path including a predetermined glideslope and a centerline, the landing system being of the type having ground installations each including a trigger input operative in response to reception of an interrogating signal from a landing aircraft to actuate a transmitter to radiate a sequence of responses to the aircraft which responses include precision guidance signals radiated through directional guidance antennas directed along the guidance path, and the landing system having airborne installations each including means for receiving said responses and means for processing them to provide indications for guiding the landing of the aircraft, the improvements comprising:

(a) at each participating ground installation, a TACAN/DME receiver tuned to a DME frequency assigned to that particular ground installation, the TACAN/DME



receiver having a trigger output occurring in response to reception of an interrogating signal, which output is connected to the trigger input of the ground installation; and

(b) in each participating aircraft an airborne installation including a TACAN/DME interrogator and antenna means for radiating interrogating signals to a ground installation, the interrogator being tunable to assigned DME frequencies whereby to select and uniquely interrogate a particular one of the ground installations, and the interrogator having a timing signal output connected to the airborne processing means for indicating the instant of transmission of each interrogating signal, whereby received responses to interrogating signals will be synchronous with the interrogating signals generated in a particular airborne installation.

4,680,588

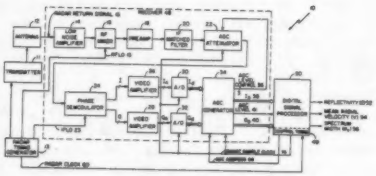
RADAR SYSTEM WITH INCREMENTAL AUTOMATIC GAIN CONTROL

Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 5, 1985, Ser. No. 804,944

Int. Cl.[4] G01S *7/34*

U.S. Cl. 342—92 **28 Claims**



1. A receiver having a variable dynamic range for processing input signals from a plurality of transmission sweeps each of said sweeps having a plurality of range cells comprising:

means for converting analog video signal representations of said input signals to digital words;

means for adjusting a dynamic range of said receiver to correspond to a range of possible amplitudes of said input signals in response to an incremental automatic gain control (AGC) level;

means coupled between said adjusting means and said converting means for generating said video signal representations for said plurality of range cells in each of said sweeps, each of said video signal representations having a real component; and

means coupled to said converting means for generating said incremental AGC level for each one of said range cells in a next one of said sweeps, said incremental AGC level determined by an absolute value of (one of) said real component of said digital words of said video signal representations, an A/D limit condition set by said absolute value, an AGC level for a corresponding one of said range cells in a present one of said sweeps, an A/D limit condition for a corresponding range cell in a previous sweep and an A/D level guardband.

4,680,589

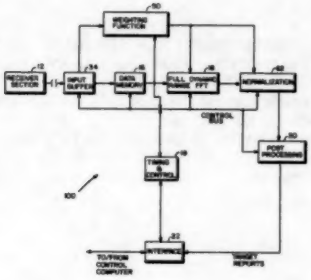
ADAPTIVE FAST FOURIER TRANSFORM WEIGHTING TECHNIQUE TO INCREASE SMALL TARGET SENSITIVITY

Stephen M. Bryant, Baltimore, and Donald J. Speir, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1984, Ser. No. 656,844

Int. Cl.[4] G01S *7/32*

U.S. Cl. 342—196 **14 Claims**



1. A radar signal processor, having an FFT circuit for processing receiver signal data, said data including a plurality of information-bearing range gates, said FFT circuit disposed for applying one of a plurality of weighting functions to a respective individual range gate, said FFT circuit thereby producing an output signal generally resulting in amplitude difference between various respective individual range gates, said radar signal processor comprising:

an input buffer for determining the magnitude of each of said range gates, wherein said input buffer makes an input buffer magnitude determination in the form of a maximum amplitude for each said range gate over a discrete period using a magnitude detector and a Log_2 computer computing the Log_2 of such detected vector magnitude for each said range gate, said input buffer including a Log_2 interim maximum amplitude memory and a comparator, said comparator and said Log_2 memory cooperating to determine a largest Log_2 value per range gate per discrete period,

a weighting function selecting circuit connected between said input buffer and said FFT circuit, responsive to said input buffer magnitude determination, said weighting function selecting circuit selecting a weighting function to be applied to each said respective individual range gate, and

a normalization circuit connected with and receiving the output signal of said FFT circuit, said normalization circuit normalizing amplitude differences in the output signal of said FFT circuit.

4,680,590

POSITION FINDING SYSTEM

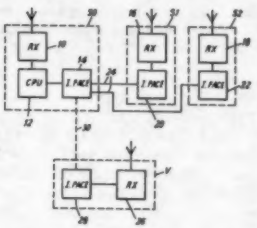
Eric Lowe, St Albans, England; Martin C. Poppe, Cambridge, Vt., and Andrew Stratton, Farnborough, England, assignors to Terrafix Limited, Welyn, England

Filed Aug. 2, 1984, Ser. No. 637,204

Claims priority, application European Pat. Off., Aug. 9, 1983, 83304611.3

Int. Cl.[4] G01S *5/10*

U.S. Cl. 342—457 **14 Claims**



1. In a position finding system of the type in which synchronized radio signals are transmitted from a plurality of transmitters stationed at known geodetic positions, to enable the position of mobile receivers to be determined from the phases of signals received from a plurality of transmitters, the improvement comprising:

a plurality of geographically separated fixed receiving stations having known geodetic positions,

calculating means at a common station for receiving phase information from all of the fixed receiving stations and for calculating therefrom the apparent geodetic azimuths of the transmitters corresponding to the wavefront directions at the fixed receiving stations, and

means for calculating azimuth corrections from the differences between true and apparent geodetic azimuths.

4,680,591

HELICAL ANTENNA ARRAY WITH RESONANT CAVITY AND IMPEDANCE MATCHING MEANS

Walter J. Axford, Chalfont St. Peter; Francis R. Trumble, Maidenhead, and Charles W. Turner, Virginia Water, all of England, assignors to EMI Limited, Hayes, England

Filed Jun. 27, 1984, Ser. No. 625,246

Claims priority, application United Kingdom, Jul. 1, 1983, 8317938

Int. Cl.[4] H01Q *1/36, 1/40*

U.S. Cl. 343—853 **5 Claims**

1. An antenna array comprising:

a plurality of helical antenna elements, each having a straight stem end portion;

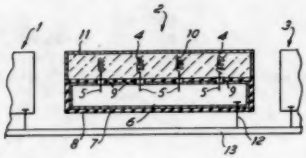
means to combine signals received at the respective helical antenna elements;

means to define a single resonant cavity, the single resonant cavity constituting signal-combining means;

a wall member defining a surface of the single resonant cavity, said wall member having a number of apertures which communicate with the single resonant cavity and said wall member providing support for the helical antenna elements;

each said helical antenna element being mounted over said wall member such that the straight stem extends through a respective aperture with the free end of the stem within the single resonant cavity, thereby to provide coupling between the elements and the cavity;

electrically-conductive material, of the wall member, forming the cavity-defining surface of that wall member;



means to control impedance between the helical antenna elements and the cavity;

the impedance-control means being constituted by a predetermined value of thickness of the electrically-conductive material of the wall member.

4,680,592

IMAGE FORMATION METHOD SUBLIMING INK THROUGH A GAS PERMEABLE MEMBRANE

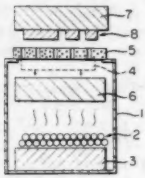
Masanaga Imamura, Fujinomiya, and Isao Mizuno, Gotenba, both of Japaa, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,942

Claims priority, application Japan, Apr. 17, 1985, 60-82007

Int. Cl.[4] G01D *9/00, 15/10*

U.S. Cl. 346—1.1 **1 Claim**



1. An image formation method utilizing a dyestuff liable to sublime or gasify, said method comprising the steps of:

forming a thin film of said dyestuff on the back surface of a gas permeable film; and

heating a heating element adjacent the back surface of said gas permeable film in response to a signal indicative of an image to generate from said dyestuff thin film a dyestuff gas flow which is representative of the image and which permeates through said gas permeable film so that said dyestuff deposits on acceptor paper adjacent the front surface of said gas permeable film to form the image on the back surface of said acceptor paper.

4,680,593

THERMAL PRINT HEAD

Shozo Takeno, Yokohama; Toshio Shimizu, and Takashi Saito, both of Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Telegraph & Telephone Corporation, Tokyo, both of, Japan

Filed Jan. 21, 1986, Ser. No. 820,095

Claims priority, application Japan, Jan. 21, 1985, 60-7459

Int. Cl.[4] G01D *15/10;* **H05B** *1/00*

U.S. Cl. 346—76 PH **8 Claims**

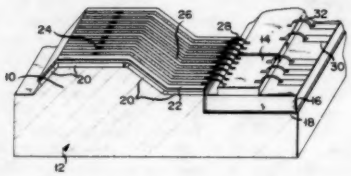
1. A thermal head comprising:

a substrate having a projection;

a rigid thin plate secured to the substrate and divided into a plurality of sections in accordance with a change in the level of the surface of the substrate;

a flexible insulating film coated over the upper surface of the rigid thin plate;

a plurality of heating elements provided on the flexible insulating film so that the heating elements correspond in location to the projection of the substrate, the heating elements being arranged in a predetermined pattern;



a plurality of lead wires provided on the flexible insulating film, one end of each of the lead wires being electrically connected to the heating elements; and

an integrated circuit for driving the heating elements, the integrated circuit being located in a lower position on the substrate than the heating elements and being electrically connected to the other ends of the lead wires to selectively drive the heating elements.

4,680,594

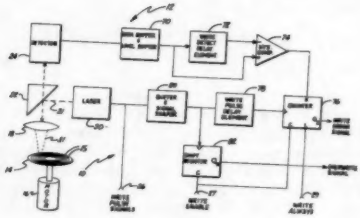
SINGLE BEAM DIRECT READ DURING WRITE AND WRITE PROTECT SYSTEM FOR USE IN AN OPTICAL DATA STORAGE SYSTEM

Roger R. Bracht, Colorado Springs, Colo., assignor to Optotech, Inc., Colorado Springs, Colo.

Filed Apr. 2, 1986, Ser. No. 847,274

Int. Cl.[4] G01D *9/42;* **G11B** *5/09*

U.S. Cl. 346—108 **11 Claims**



1. Direct read during write apparatus for use in an optical data storage system, including:

an optical disk;

laser means for producing a beam of radiation to write data onto the optical disk during write operations;

radiation detector means for producing signals representative of radiation received from the optical disk, wherein the signals include write detect signals representative of radiation detected during write operations; and

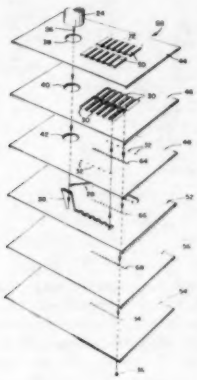
slope detector means responsive to the radiation detector means for producing verification signals indicative of the accuracy of write operations as a function of a slope of the write detect signals.

4,680,595

IMPULSE INK JET PRINT HEAD AND METHOD OF MAKING SAME

Antonio S. Cruz-Uribe, Cobalt; David W. Hubbard, Stamford, and Gopalan Raman, Bethel, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,584
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 29 Claims



1. An impulse ink jet print head comprising:

a plurality of operating plates held together in a superposed relationship including at least:

a first plate including a pair of proximately disposed nozzles therein for ejecting droplets of ink therethrough;

a second plate defining a pair of generally coplanar elongated ink chambers having relatively long sidewalls and relatively short endwalls, said chambers being axially aligned along their major axes and proximately opposed to one another at their said endwalls, each of said chambers connected to an ink supply and having an outlet for directing ink toward an associated one of said nozzles in said first plate;

each of said nozzles having a central axis extending transversely of the planes of said plates and intersecting said second plates at proximate extremities of each of said chambers;

said plates having passage means connecting each of said nozzles with an associated one of said outlets, the passage means associated with each of said chambers being proximately disposed; and

a third plate contiguous with said second plate and including driver means for displacing ink in each of said chambers thereby causing the ejection of ink droplets from each of said nozzles.

4,680,596

METHOD AND APPARATUS FOR CONTROLLING INK-JET COLOR PRINTING HEADS

David J. Logan, Glastonbury, Conn., assignor to Metromedia Company, Secaucus, N.J.

Continuation of Ser. No. 637,143, Aug. 2, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 873,079
Int. Cl.[4] G01D *15/18*; H04N *1/40, 1/23*
U.S. Cl. 346—140 PD 10 Claims

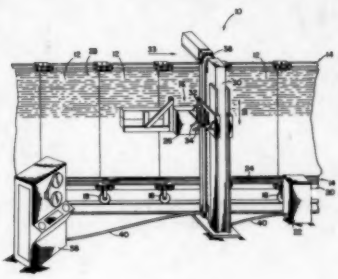
1. Apparatus for controlling an ink-jet printing means in a large scale graphic system to apply dots of one color and of substantially fixed size to a plurality of pixel areas located sequentially along a line scanned by said printing means and within each of which pixel areas, potential dot positions form an array identical for all pixel areas, said apparatus comprising:

means for producing a sequential series of image density signals each representative of the color tone value at which a respective one of said pixel areas is to be printed by dots of said one color, said density signals having any one of F integral values;

means for providing, for at least one of said integral values which said density signals may take, a tabular listing of a number of different patterns according to which dots may be arranged in a pixel area to produce the tone value corresponding to said one integral value;

means for randomly selecting a different one of said patterns from said tabular listing whenever a density signal of said one integral value appears, and

means for operating said ink-jet printing means to apply dots



in a pattern randomly selected from said tabular listing onto the dot positions of the associated pixel are in the sequence of pixel areas to be printed, each of said dot positions comprising a pixel area being available to receive a dot and being printed when a corresponding dot comprising the random pattern is to be printed in the dot position, wherein the pattern of an immediately adjacent advance pixel area is randomly selected from the tabular listing and the pattern of an immediately adjacent trailing pixel area in the sequence is randomly selected from the tabular listing, each of said immediately adjacent pixel areas in a sequence of pixel areas for a given integral value being printed with a different randomly selected pattern.

4,680,597

SELF-CONTAINED TYPE PRESSURE SENSITIVE RECORD SHEET

Shigeo Okamoto, Suita, and Tomoharu Shiozaki, Amagasaki, both of Japan, assignors to Kanzaki Paper Manufacturing Co. Ltd., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,703
Claims priority, application Japan, Aug. 16, 1984, 59-171326
Int. Cl.[4] B41M *5/16*
U.S. Cl. 503—214 3 Claims

1. A self-contained type pressure sensitive record sheet prepared by coating a substrate with a mixture of microcapsules containing a color former and an inorganic solid acid as a color acceptor and drying the resulting coating, the mixture containing 10 to 30% by weight of polyvinyl alcohol based on the weight of the inorganic solid acid, said polyvinyl alcohol having a polymerization degree of 400 to 2400.

4,680,598

CHROMOGENIC MATERIALS EMPLOYING FLUORAN COMPOUNDS

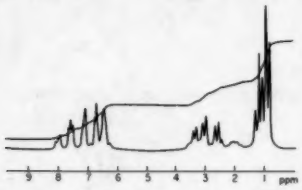
Takeo Obitsu, Ohmiya; Tetsuo Igaki, Kawagoe; Kimiaki Kinoshita, Kitamoto; Morio Nanbu, Fujimi, and Shinichi Satoh, Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

Filed Apr. 8, 1986, Ser. No. 849,759

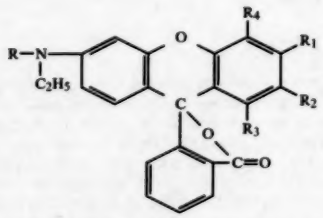
Claims priority, application Japan, Apr. 18, 1985, 60-81361; Feb. 21, 1986, 61-35094

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—217 **58 Claims**



1. A chromogenic recording material which comprises a substrate, a fluoran compound of the formula



wherein R is an isobutyl or isopentyl group, R_1 is hydrogen, a halogen atom or an alkyl group, R_2 is hydrogen, a halogen atom or an alkyl group, R_3 is hydrogen, and R_4 is hydrogen, or R_4 and R_1 as well as R_2 and R_3, when taken together with the carbon atoms to which they are attached, form a substitued or unsubstituted benzene ring wherein the substituent is a halogen atom, as a color forming component, and a color developer capable of causing the color formation of the fluoran compound.

4,680,599

CATHODE RAY TUBE DISPLAY SYSTEM AND METHOD HAVING BIDIRECTIONAL LINE SCANNING

Ronald D. Wertz, Boulder; James H. Orszulak, Nederland, and Christopher L. Sweeney, Denver, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 29, 1985, Ser. No. 728,387

Int. Cl.[4] G09G *1/14*

U.S. Cl. 340—744 **20 Claims**

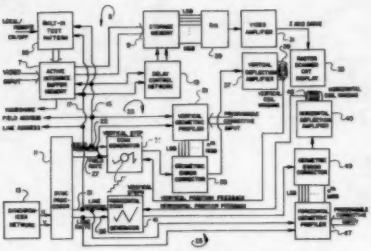
1. A cathode ray tube display system having bidirectional line scanning, said system comprising:

memory means for receiving video information and storing said received information by scan lines;

coupling means connected with said memory means for coupling stored video information from said memory means by said scan lines to a cathode ray tube for display thereby;

deflection means for deflecting the beam of said cathode ray tube to thereby effect raster scanning of said cathode ray tube by individual lines and for controlling the direction of raster scanning for each scan line of said cathode ray tube so that said lines are alternately scanned in opposite directions starting with a predetermined one of said lines; and

control means connected with said memory means and said deflection means so that video information coupled from said memory means through said coupling means to said cathode ray tube for display there is coupled from said memory means in the same order as received by said



memory means with respect to said predetermined one of said scan lines and every other succeeding line thereafter, and is coupled from said memory means in reverse order as recieved by said memory means with respect to the line succeeding said predetermined one of said scan lines and every other succeeding line thereafter, whereby said received video information is displayed at said cathode ray tube without requiring retrace between scan lines.

4,680,600

SEMICONDUCTOR DEVICE

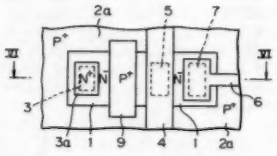
Akinori Tahara, Zushi; Hiromu Enomoto, Kawasaki, and Yasushi Yasuda, Machida, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 625,156, Jun. 27, 1984, abandoned. This application Oct. 21, 1986, Ser. No. 921,811

Claims priority, application Japan, Jun. 30, 1983, 58-116954

Int. Cl.[4] H01L *29/56, 29/90, 27/04*

U.S. Cl. 357—15 **7 Claims**



1. A semiconductor device formed on a semiconductor substrate having a first conductivity type and having an input circuit for protecting an internal circuit, said input circuit comprising:

a first impurity region having a second conductivity type connected to an external terminal and having an island-shape formed on said semiconductor substrate and surrounded by an isolation region having an opposite conductivity type;

a clamp diode comprising an electrode layer in contact with said first impurity region; and

a PN junction type protection diode comprising a second impurity region having said first conductivity type, said second impurity region crossing said first impurity region remote from said clamp diode electrode layer at a position between said clamp diode and a portion of said first impurity region connected to said external terminal and extending to said isolation region;

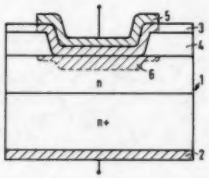
the reverse withstand voltage of said PN junction type protection diode being smaller than that of said clamp diode, whereby excessive current flow through said clamp diode due to a high positive voltage applied to said external terminal is prevented.

4,680,601

SCHOTTKY POWER DIODE

Heinz Mitlehner, and Bernd Kolbesen, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 494,697, May 16, 1983, abandoned. This application Jul. 15, 1986, Ser. No. 885,814
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219606
Int. Cl.[4] H01L 29/86
U.S. Cl. 357—15 6 Claims



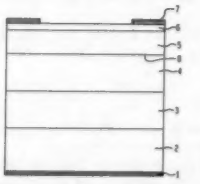
1. A Schottky power diode comprising: a semiconductor substrate haing a given band gap, said semiconductor substrate comprising monocrystalline silicon material, an insulating layer disposed on said substrate, a semi-insulating intermediate layer at least partly disposed on said insulating layer, and a Schottky contact disposed on said intermediate layer, said intermediate layer being disposed between said Schottky contact and said substrate, said intermediate layer having a density of localized states from 10^{17} to 10^{20} eV cm^{-3}, said intermediate layer having a band gap larger than said given band gap in said semiconductor substrate, said intermediate layer having a resistivity of between 10^5 and 10^{11} ohm cm, said intermediate layer being partly disposed on said insulating layer and being partly disposed on said substrate in a window formed in said insulating layer and said Schottky contact extending beyond the edge of said window formed in said insulating layer on to said intermediate layer.

4,680,602

LIGHT EMITTING DIODE

Hisatsune Watanabe, and Akira Usui, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,744
Claims priority, application Japan, Sep. 6, 1983, 58-163453
Int. Cl.[4] H01L 33/00
U.S. Cl. 357—17 14 Claims



1. A light emitting diode comprising a multilayer semiconductor crystal having a p-n hetero junction structure comprising a substrate of a first conductivity type, a GaAsP graded layer of said first conductivity type formed on said substrate, an active layer of GaAsP of said first conductivity type formed on said graded layer, and a window layer of either InGaP or InGaAsP of a second conductivity type formed on said active layer;

a first electrode provided on the top surface of said crytal and having an aperture permitting the exit of light emitted from an emitting region of said active layer through said window layer; and

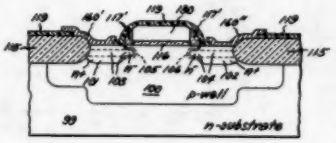
a second electrode provided on the bottom surface of said crystal.

4,680,603

GRADED EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

Ching-Yeu Wei, and Joseph M. Pimbley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,640
Int. Cl.[4] H01L 29/78, 29/08, 29/36
U.S. Cl. 357—23.3 16 Claims



1. A metal oxide semiconductor field effect transistor comprising:

a semiconductor body doped with a first polarity dopant;

an insulating layer disposed over a portion of said body; and

an electrically conductive gate electrode disposed over said insulating layer so as to be electrically insulated from said semiconductor body;

said semiconductor body having a source region heavily doped with a second polarity dopant and a drain region heavily doped with said second polarity dopant, said source and drain regions being disposed in said semiconductor body to a specified depth on either side of said gate electrode;

said semiconductor body also having a lightly doped protrusion extending from at least one of said source and said drain regions, said dopant in said protrusion being a second polarity dopant, each said protrusion being disposed beneath the surface of said semiconductor body and extending toward the region beneath said gate electrode, each said protrusion being spaced apart from the boundary between said semiconductor body and said insulating layer and each said protrusion having a graded region substantially surrounding said protrusion, said protrusion also including at least two second polarity dopants exhibiting distinct diffusivity characteristics.

4,680,604

CONDUCTIVITY MODULATED MOS TRANSISTOR DEVICE

Akio Nakagawa, Hiratsuka, and Kiminori Watanabe, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 707,556, Mar. 4, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 930,083
Claims priority, application Japan, Mar. 19, 1984, 59-52810
Int. Cl.[4] H01L 29/78, 29/74
U.S. Cl. 357—23.4 5 Claims

1. A conductivity modulated MOS transistor device comprising:

a first semiconductor layer of one conductivity type;

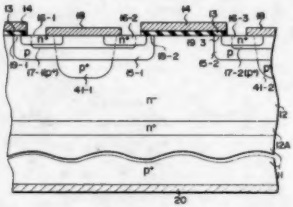
a second semiconductor layer of an opposite conductivity

type, formed in contact with said first semiconductor layer;

a first semiconductor region of said one conductivity type formed by diffusion in a surface area of said second semiconductor layer;

a second semiconductor region of said opposite conductivity type formed by diffusion in a surface region of said first semiconductor region to face said second semiconductor layer, the surface region of said first semiconductor region sandwiched between said second semiconductor region and said second semiconductor layer forming a channel region, and a source electrode formed on the second semiconductor region;

a gate region including a gate insulation layer formed at least on said channel region, and a gate electrode formed on the gate insulation layer;



a third semiconductor region of said one conductivity type formed by diffusion in said first semiconductor region without entering the channel region, and shallower than said first semiconductor region and deeper than said second semiconductor region, and including a portion which lies outside a vertical projection of said source electrode directly under said second semiconductor region and has a higher impurity concentration than said first semiconductor region; and

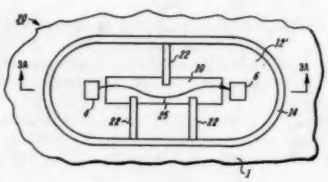
a fourth semiconductor region of said one conductivity type formed by diffusion from central portions of the surface of said third semiconductor region within the vertical projection of said third semiconductor region and deeper than the first semiconductor region without extending to said portion of said third semiconductor region and said channel region.

4,680,605

HIGH VOLTAGE DEPLETION MODE TRANSISTOR WITH SERPENTINE CURRENT PATH

Russel A. Martin, Santa Monica, and Steven A. Buhler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 588,172, Mar. 12, 1984, abandoned.
This application Jan. 13, 1986, Ser. No. 818,384
Int. Cl.⁴ H01L *29/06, 29/78, 27/02, 29/34*
U.S. Cl. 357—23.11 **2 Claims**



1. An MOS transistor including source and drain regions of one conductivity type formed in a substrate of the other conductivity type, a channel region of said one conductivity type between and connecting said source and drain regions, a gate electrode overlying at least a portion of said channel region, and a conductive barrier ring displaced from and surroundings said regions,

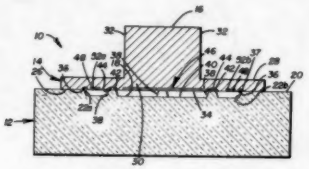
the improvement comprising a plurality of thin, highly doped, non-opposed, surface regions of said other conductivity type extending from said barrier ring to beneath said gate electrode for restricting the flow of source to drain current to a serpentine path beneath said gate electrode.

4,680,606

SEMICONDUCTOR TRANSDUCER

James W. Knutti; Henry V. Allen, both of Fremont; Kurt E. Petersen, San Jose, and Carl R. Kowalski, Fremont, all of Calif., assignors to Tactile Perceptions, Inc., Fremont, Calif.

Filed Jun. 4, 1984, Ser. No. 617,122
Int. Cl.⁴ H01L *29/84;* **G01B** *7/16*
U.S. Cl. 357—26 **27 Claims**



1. A semiconductor transducer comprising:

a substrate having a well formed in one surface thereof;

a semiconductor layer having first and second substantially parallel surfaces, the edge portions of said first surface being bonded to said substrate about the periphery of said well, said layer forming a diaphragm over said well;

a pedestal projecting outwardly from said second surface and being disposed above said well for deflecting said diaphragm in response to a force applied to said pedestal, said pedestal having one or more side walls being substantially orthogonal to said second surface;

integrated circuit means for transducing deflections of said diaphragm into an electrical signal and being formed at said first surface within said diaphragm, said integrated circuit means having means for sensing deflections of said diaphragm and means responsive to said sensing means for developing said electrical signal as a function of the deflection of said diaphragm; and

means for electrically conducting said signal to a point on said substrate exteriorly of said semiconductor layer.

4,680,607

PHOTOVOLTAIC CELL

Takeo Fukatsu; Masaru Takeuchi, both of Kyoto, and Kazuyuki Goto, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed May 3, 1985, Ser. No. 730,670
Claims priority, application Japan, May 11, 1984, 59-94915; Jun. 5, 1984, 59-114842
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 357—30 **18 Claims**

1. A photovoltaic cell comprising:

a transparent substrate,

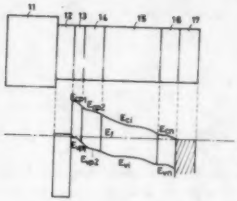
a transparent first electrode layer on said substrate,

a first semiconductor layer of a first conductivity type on said first electrode layer, said first semiconductor layer being approximately 25 to 300 Å in thickness and having activation energy of less than 0.3 eV for generation of major carriers,

a second semiconductor layer of the first conductivity type on said first semiconductor layer, said second semiconductor layer being approximately 100 to 1000 Å in thick-

ness and having activation energy of more than 0.3 eV for generation of major carriers,

a third semiconductor layer of a second conductivity type on said second semiconductor layer,



a fourth semiconductor layer of a third conductivity type on said third semiconductor layer, and

a second electrode layer on said fourth semiconductor layer.

4,680,608

SEMICONDUCTOR DEVICE

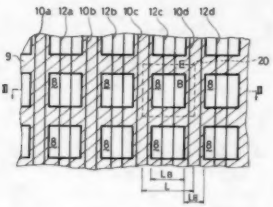
Yukio Tsuzuki, Nukata; Masami Yamaoka, Anjo, and Shoji Toyoshima, Kounan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,571

Claims priority, application Japan, Feb. 7, 1984, 59-21324

Int. Cl.[4] H01L *29/72*

U.S. Cl. 357—36 **4 Claims**



1. A semiconductor device comprising:

a substrate acting as a collector area with a first conduction type;

a base area, having a second conduction type, reverse to said first conduction type of said substrate, said base area being formed on said substrate; and

an emitter area having said first conduction type, and which is formed in said base area in a mesh-like pattern,

wherein the width of said emitter area ranges from 50 to 10 microns.

4,680,609

STRUCTURE AND FABRICATION OF VERTICALLY INTEGRATED CMOS LOGIC GATES

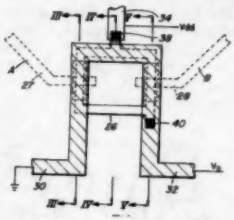
Iain D. Calder, Nepean; Thomas W. Macelwee, and Abdalla A. Naem, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 24, 1984, Ser. No. 653,192

Int. Cl.[4] H01L *27/02, 29/04, 29/78*

U.S. Cl. 357—42 **19 Claims**

1. A vertically integrated MOS logic gate comprising first and second active semiconductor layers, one of the active semiconductor layers having an open loop with a pair of parallel legs and an interconnecting portion extending between said parallel legs, said open loop being formed by at least two transistors, one of said transistors having a source region, a channel region and a drain region positioned along one of said parallel legs and the other of said transistors having a source region, a channel region and a drain region positioned along the other of said parallel legs, and the other active semiconductor layer having at least one closed loop in which are formed a plurality of transistors, the transistors in one semiconductor layer being substantially vertically aligned with respect to transistors in the other semiconductor layer and having respective common control gates located between the layers, each



control gate controlling one vertically coincident transistor pair, each transistor in said closed loop having a source and a drain region separated by a channel region, at least one of the vertically aligned transistor pairs having drain regions contacting one another at a contact zone, a first and a second lead connected to the open loop to connect the open loop transistors in series, and a third and a fourth lead connected to the or each close loop to connect the closed loop transistors in parallel.

4,680,610

SEMICONDUCTOR COMPONENT COMPRISING BUMP-LIKE, METALLIC LEAD CONTACTS AND MULTILAYER WIRING

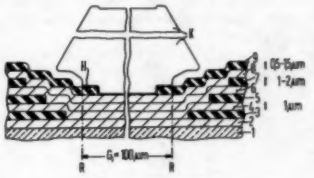
Erich Pammer, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,364

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343367

Int. Cl.[4] H01L *23/50, 29/40*

U.S. Cl. 357—68 **11 Claims**



1. In a semiconductor component contact structure a multilayer wiring formed of a plurality of conductive tracks separated by insulating layers is provided on the semiconductor component, and wherein bump-like, metallic lead contacts are provided at contact locations, at a given contact location the lead contact being connected to a plurality of the conductive tracks through an aperture formed in a passivation layer lying over the multi-layer wiring, wherein the improvement comprises:

an area being defined by a maximum horizontal expanse of a portion of the lead contact in overlying contact with the final passivation layer;

insulating layers at said contact location lying outside of a vertical projection of said area;

the conductive tracks forming a layer sequence beneath the lead contact, the lead contact having a projection through

the aperture of the passivation layer in electrical abutting contact with a top one of the conductive tracks; and

the individual insulating layers terminating in the horizontal direction outwardly of and at different distances from the projection of said area.

4,680,611

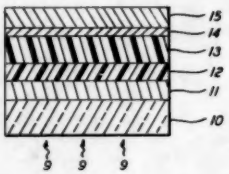
MULTILAYER OHMIC CONTACT FOR P-TYPE SEMICONDUCTOR AND METHOD OF MAKING SAME

Bulent M. Basol, Los Angeles, Calif., assignor to Sohio Commercial Development Co., Cleveland, Ohio

Filed Dec. 28, 1984, Ser. No. 687,092

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—71 **14 Claims**



1. An ohmically conductive contact for a thin film p-type semiconductor compound formed of at least one of the metal elements of Class IIB of the Periodic Table of Elements and at least one of the non-metal elements of Class VIA of the Periodic Table of Elements comprising a first layer of copper contiguous with said p-type semiconductor compound and having a layer thickness of from about 5 Angstroms to about 50 Angstroms and a second layer thereon comprising at least a second conductive metal.

4,680,612

INTEGRATED SEMICONDUCTOR CIRCUIT INCLUDING A TANTALUM SILICIDE DIFFUSION BARRIER

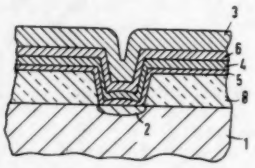
Konrad Hieber, Bernau; Franz Neppl, and Konrad Schober, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,380

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3513002

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—71 **10 Claims**



1. An integrated semiconductor circuit comprising:

a silicon substrate having an impurity doped circuit therein,

a layer of silicon dioxide formed on said substrate and having a contact hole therein overlying said circuit,

an outer contact interconnect layer composed of aluminum or an aluminum alloy for providing electrical contact to said circuit,

a tantalum disilicide diffusion barrier layer disposed between said circuit and said interconnect layer, and

a layer of substantially pure tantalum both above and below said tantalum disilicide diffusion barrier layer.

4,680,613

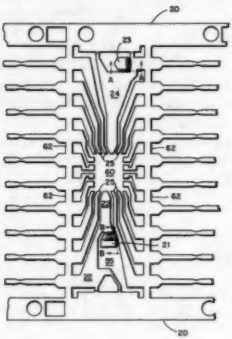
LOW IMPEDANCE PACKAGE FOR INTEGRATED CIRCUIT DIE

Wilbert E. Daniels, West Buckston, and Dana J. Fraser, South Portland, both of Me., assignors to Fairchild Semiconductor Corporation, Palo Alto, Calif.

Filed Dec. 1, 1983, Ser. No. 557,119

Int. Cl.[4] H01L *23/48, 23/30*

U.S. Cl. 357—72 **27 Claims**



1. A low inductive impedance dual in-line package for an integrated circuit die comprising:

a lead frame formed with a plurality of electrically active lead fingers lying in a common plane and including a ground lead finger, said lead frame formed with a central opening without a die attach paddle and without paddle support fingers;

a ground plate forming a die attach plane parallel with said lead frame for supporting an integrated circuit die attached to one side of the ground plate, said ground plate having an area substantially coextensive with the area of the common plane of the lead fingers and a die attach side facing the lead frame, said ground plate being spaced from the lead frame for imaging signal fields of the lead fingers in the ground plate;

a dielectric layer formed between the lead frame and ground plate;

electrical contact means providing parallel electrical coupling between the ground lead finger of the lead frame and the ground plate thereby providing a ground path through the ground plate with planar configuration to minimize inductive impedance to ground current and to minimize cross coupling of signals between the electrically active lead fingers;

an integrated circuit die bonded to the die attach side of the ground plate and aligned within the central opening of the lead frame; said integrated circuit die being formed with a ground terminal pad;

and interconnect lead wire means bonded between the ground terminal pad of the integrated circuit die and the ground plate.

4,680,614

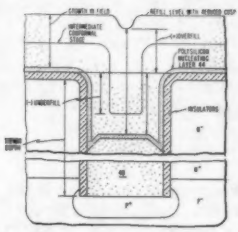
PLANAR VOID FREE ISOLATION STRUCTURE

Klaus D. Beyer, 3 Tamidan Rd., Poughkeepsie, N.Y. 12601, and Victor J. Silvestri, R.D. 9, Beverly Ct., Hopewell Junction, N.Y. 12533

Division of Ser. No. 624,425, Jun. 24, 1984, Pat. No. 4,528,047. This application Mar. 14, 1985, Ser. No. 711,554

Int. Cl.[4] H01L *21/95, 27/04*

U.S. Cl. 357—50 **7 Claims**



1. A void free isolated semiconductor structure comprising:

a pattern of substantially vertically sided trenches within a semiconductor body;

a first insulating layer upon the sidewalls of said trenches;

combined void free epitaxial silicon and polycrystalline silicon layers substantially located inside said trenches, said combined silicion layers comprising,

an epitaxial layer extending from the base of said trenches and filling said trenches up to between about 0.3 to 4.0 micrometers from the upper surface of said trenches,

said epitaxial layer having a planar upper surface,

said planar upper surface being substantially parallel to said base of said trench, and

a polycrystalline silicon layer over said planar upper surfaces of said epitaxial layer;

a second insulating layer covering the exposed upper surface of said polycrystalline silicon layer and the exposed surfaces of said first insulating layer, isolating said pattern of trenches from adjoining structures that exist over said trenches.

4,680,615

SILICON SEMICONDUCTOR COMPONENT WITH AN EDGE CONTOUR MADE BY AN ETCHING TECHNIQUE, AND METHOD FOR MANUFACTURING THIS COMPONENT

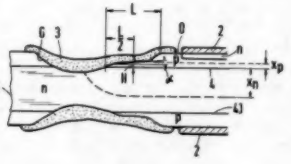
Oswald Götzenbrucker, Worms, and Gerhard Popp, Lampertheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 744,811

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422051

Int. Cl.[4] H01L *29/06, 21/306;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 357—55 **6 Claims**



6. Silicon semiconductor component with a wafer-like silicon semiconductor body with an edge contour made by an etching technique, comprising a p-region parallel to a principal surface of the semiconductor body, a n-region beneath the p-region, a pn-junction, a more heavily doped p-region and a less heavily doped n-region, a passivating ditch in the principal surface between the more heavily doped n-region and the pn-junction leading into the passivating ditch, in which the edge contour has a flank length designated L which runs between the emergence of the pn-junction into the passivating ditch and the principal surface of the semiconductor body, and has a small angle of inclination designated α of 1° to 7° with the angle of inclination α of the edge contour nearly uniform over the major part of the flank length L and that the following relationships:

$L=(0.8 \ldots 1.6).x_n$ and

$H=(0.5 \ldots 1.2).x_p$, where

H = the height of the p-doped silicon layer over the pn-junction, measured in the center of the flank length L,

x_n = the extent of the space charge zone into the n-region,

x_p = the extent of the space charge zone into the p-region at cut-off voltage of the component.

4,680,616

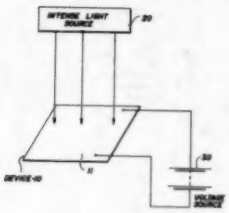
REMOVAL OF DEFECTS FROM SEMICONDUCTORS

Alan E. Delahoy, Rocky Hill, and Thomas Tonon, Princeton, both of N.J., assignors to Chronar Corp., Princeton, N.J.

Filed May 9, 1986, Ser. No. 861,555

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 357—59 **14 Claims**



1. The method of removing defects from an amorphous semiconductor having a PIN junction therein, which comprises the steps of

(a) applying a reverse bias potential to the semiconductor to create an electric field across said P-I-N junction; and

(b) irradiating said semiconductor with photon energy greater than the semiconductor bandgap energy, wherein said reverse bias potential is applied before the irradiation; and

(c) extinguishing said irradiation before removing said bias potential, thereby preventing degradation that would occur in the presence of irradiation without bias.

4. The method of claim 1 wherein the reverse bias potential is in the range from 1 to 10 volts and the radiation has an intensity in the range from 1 to 100 suns.

4,680,617

ENCAPSULATED ELECTRONIC CIRCUIT DEVICE, AND METHOD AND APPARATUS FOR MAKING SAME

Milton I. Ross, 400 College Ave., Haverford, Pa. 19041

Filed May 23, 1984, Ser. No. 613,172

Int. Cl.[4] H01L *23/28, 39/02, 23/48, 25/04*

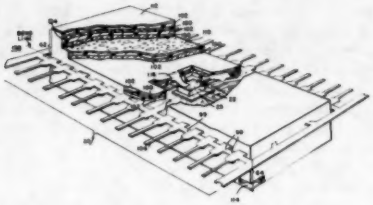
U.S. Cl. 357—72 **38 Claims**

1. An encapsulated electronic circuit device comprising:

a first assembly including at least one electronic circuit device connected by bonded wires to an array of conductive leads extending therefrom; and

a second assembly including plural generally parallel mutu-

ally laminated layers of plastic resin and fiber completely surrounding and encapsulating said first assembly except



for the distal ends of said leads which remain exposed for external electrical connections.

4,680,618

PACKAGE COMPRISING A COMPOSITE METAL BODY BROUGHT INTO CONTACT WITH A CERAMIC MEMBER

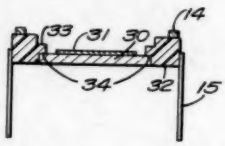
Toshio Kuroda, and Koichi Kumazawa, both of Nagoya, Japan, assignors to Narumi China Corporation, Nagoya, Japan

Filed Sep. 7, 1983, Ser. No. 530,093

Claims priority, application Japan, Sep. 9, 1982, 57-157684

Int. Cl.⁴ H01L *23/02*

U.S. Cl. 357—74 **2 Claims**



1. A package for use in encapsulating a semiconductor device, said package comprising a first member of a ceramic material and a second member of composite material comprising by weight of about 1 to 30% of a copper portion and about 99 to 70% of a preselected material selected from the group consisting of tungsten and molybdenum in the form of a porous block, said porous block having been impregnated with said copper portion from the molten state of said copper.

4,680,619

SEMICONDUCTOR DEVICE HAVING SILICON CONDUCTOR TRACKS CONNECTED BY A METAL SILICIDE TRACK

Jan Lohstroh, and Wilhelmus J. M. J. Josquin, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

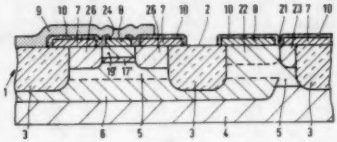
Filed Aug. 31, 1984, Ser. No. 645,897

Claims priority, application Netherlands, Sep. 15, 1983, 8303179

Int. Cl.⁴ H01L *29/04*

U.S. Cl. 357—86 **8 Claims**

1. A semiconductor device comprising a semiconductor body of silicon having a first main surface, a conductor structure with conductor tracks which are spaced apart at said surface, which tracks comprise silicon of two opposite conductivity types and which are connected to each other in an electrically conducting manner, and a layer of metal silicide, at least at the area of the conductive connection the conductor tracks being located on the semiconductor surface and being connected to each other by said layer of metal silicide which is located on the semiconductor surface between the conductor tracks and which contacts parts of the conductor tracks, said



layer of metal silicide connecting together said conductor tracks and said semiconductor surface.

4,680,620

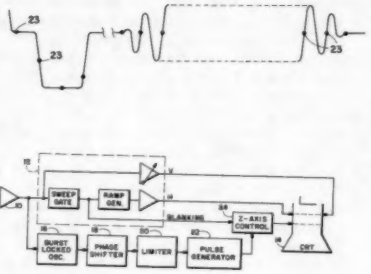
MEASUREMENT OF SC/H PHASE USING A SUBCARRIER TIME MARK GENERATOR AND A CALIBRATED PHASE SHIFTER

Daniel G. Baker, Aloha, and Kenneth M. Ainsworth, Bend, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 6, 1986, Ser. No. 836,944

Int. Cl.⁴ H04N *17/02, 9/44*

U.S. Cl. 358—10 **10 Claims**

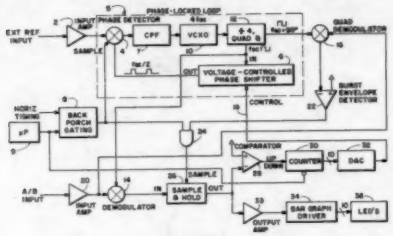


1. Apparatus for indicating the timing relationship between a reference point of an input signal that repeats at a first, lower frequency and a signal element that repeats at a second, higher frequency, comprising a display device having a display surface, means for generating a visible dot on the display surface, first deflection means for repeatedly deflecting the position of the visible dot in a first direction at a uniform rate and in synchronism with the repetition of the input signal, and second deflection means for deflecting the position of the visible dot in a second direction that is substantially perpendicular to said first direction by a distance that depends substantially linearly upon the amplitude of the input signal, whereby the display device displays a visible trace representing the waveform of at least a part of the input signal, and the apparatus also comprising signal generator means for generating a continuous repetitive signal having a repetition frequency that is integrally related to said second frequency, phase adjustment means for selectively varying the phase of the continuous repetitive signal relative to said signal element, and modulator means for modulating the visible dot in response to the continuous repetitive signal, in a selected dimension other than spatially in a linear relationship with the amplitude of the continuous repetitive signal, whereby the visible trace includes features indicating the phase of the continuous repetitive signal and the phase relationship between the signal element and the reference point can be determined by calibrated adjustment of the phase of the continuous repetitive signal.

4,680,621
METHOD AND APPARATUS FOR VARIABLE PHASING OF PERIODIC SIGNALS

Daniel G. Baker, Aloha, and Magaret A. Feisel, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 16, 1985, Ser. No. 776,313
Int. Cl.[4] H04N *9/45, 9/44;* **H04L** *7/00, 25/36*
U.S. Cl. 358—19 **11 Claims**

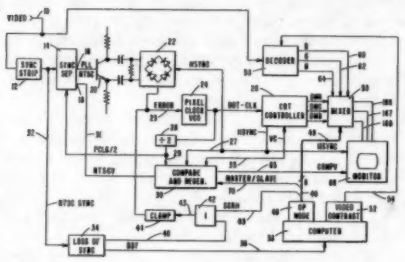


1. A method of generating a periodic output signal at a selectively variable phase relative to a periodic input signal, comprising comparing the input signal with a third periodic signal that has a frequency which is less than the frequency of the input signal and that has a duty cycle which is equal to one-half of the ratio of the frequency of the third periodic signal to the frequency of the periodic input signal, detecting the phase difference between the input signal and that frequency component of the third periodic signal which has the same frequency as the input signal, generating said output signal at a frequency such as to maintain a predetermined phase relationship between the periodic input signal and said frequency component, and selectively varying the phase of said output signal relative to said third periodic signal.

4,680,622
APPARATUS AND METHOD FOR MIXING VIDEO SIGNALS FOR SIMULTANEOUS PRESENTATION

Lawrence C. Barnes, Apipka, and Robert G. Mankedick, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 11, 1985, Ser. No. 700,567
Int. Cl.[4] H04N *5/272, 5/262*
U.S. Cl. 358—22 **14 Claims**

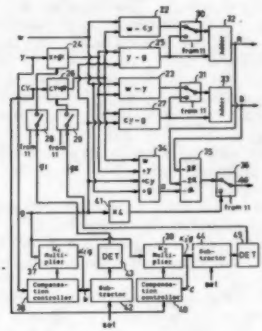


1. An apparatus for combining two video signals comprising:
a first input for receiving a first video signal having a first amplitude;
a second for receiving a second video signal having a second amplitude;
proportioning means connected to said first and second inputs, said proportioning means for algebraically adding a fixed portion of said first amplitude with a fixed portion of said second amplitude to give a composite amplitude, said fixed portions of said first and second amplitudes being inversely proportional to one another; and
output means connected to said proportioning means for providing said composite amplitude for video display.

4,680,623
SOLID STATE COLOR IMAGING APPARATUS PRODUCING CHROMINANCE AND LUMINANCE SIGNALS FROM UNSATURATED ORES OF N COLOR SIGNALS

Makoto Fujimoto, Ibaraki; Yoshinori Kitamura, Takatsuki; Atsushi Morimura, Nara, and Hiroki Matsuoka, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 11, 1985, Ser. No. 700,382
Claims priority, application Japan, Feb. 15, 1984, 59-26324
Int. Cl.[4] H04N *9/077, 9/04*
U.S. Cl. 358—44 **4 Claims**



1. A solid state color imaging apparatus comprising:
a plurality of color filters of n different predetermined colors arranged in a predetermined manner;
a solid state imaging sensor for receiving light from an image through said color filters and producing therefrom n color signals having varying levels;
operation means for receiving said n color signals from said solid state imaging sensor and operating upon said signals for producing at least one of chrominance signals and a luminance signal either in a first mode such that said at least one of chrominance signals and a luminance signal are produced using all of said n color signals, or in a second mode in which said at least one of chrominance signals and a luminance signal are produced by using only n−1 of said n color signals wherein one of the n color signals is omitted because it has reached a predetermined saturation level; and
control means, responsive to said n color signals and connected to said operation means, for switching the mode of operation of said operation means from said first mode to said second mode when said control means determines that one of said n color signals has reached its predetermined saturation level.

4,680,624

SIGNAL PROCESSING CIRCUIT FOR A COLOR VIDEO CAMERA PROVIDING SHADING CORRECTION BY VARYING THE BLACK CLAMPING LEVEL

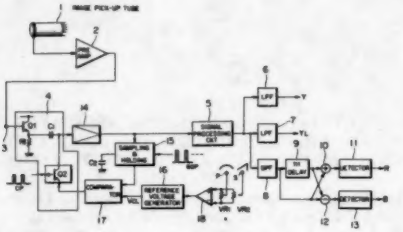
Toshio Murakami, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,070

Claims priority, application Japan, Jul. 25, 1983, 58-134341; Jul. 29, 1983, 58-137544; Jul. 29, 1983, 58-137543

Int. Cl.[4] H04N *9/077, 5/18, 9/64, 9/68*

U.S. Cl. 358—44 **13 Claims**



1. A signal processing circuit for a color video camera in which a color video signal is obtained by using a single image pickup device provided with a color stripe filter on a photoconductive surface, said circuit comprising:

a clamping circuit for clamping a black level of a video signal produced from the image pickup device to a predetermined level determined by an externally applied reference potential;

correcting means for superimposing onto said reference potential a signal having a waveform with a polarity opposite to that of a shading waveform in said video signal;

means for deriving a luminance signal and a plurality of color difference signals from an output signal of said clamping circuit;

means for modulating a carrier chrominance signal with said derived color difference signals;

variable gain amplifier means for amplifying said carrier chrominance signal modulated with said color difference signals;

means for detecting the level of a luminance component of a video signal produced from said image pickup device; and

means for controlling the gain of said variable gain amplifier means when said detecting means detects that the level of said luminance component is lower than a first predetermined level.

4,680,625

METHOD AND APPARATUS FOR MULTICOLOR IMAGE FORMING

Hisashi Shoji; Satoshi Haneda, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

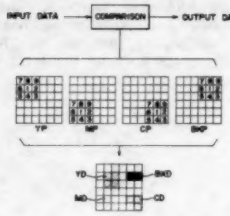
Filed Jul. 9, 1985, Ser. No. 753,335

Claims priority, application Japan, Jul. 18, 1984, 59-150448; Jul. 18, 1984, 59-150449; Jul. 18, 1984, 59-150450; Jul. 18, 1984, 59-150451

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 **13 Claims**

1. A color image forming apparatus comprising means for applying an original image data consisting of a plurality of different color informations for conversion, means for converting said original image data, means for forming a latent image on a single image retainer on the basis of a result of said converting means, a plurality of developing means for developing said latent image with toners of mutually different colors, means for transferring a toner image formed on said image retainer to a transfer material, wherein toner images of a plurality of mutually different colors form a multicolor toner on said image retainer by repeating the formation and development of



said latent image and are transferred in one step onto said transfer material.

4,680,626

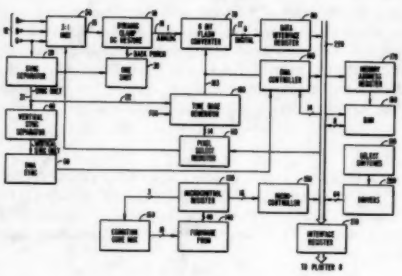
COLOR IMAGE PROCESSING SYSTEM FOR CONVERTING ANALOG VIDEO-TO-DIGITAL DATA

Michael F. Deering, Mountain View, and Galen Collins, San Jose, both of Calif., assignors to Benson, Inc., Mountain View, Calif.

Filed Apr. 9, 1985, Ser. No. 721,359

Int. Cl.[4] H04N *1/46, 5/78*

U.S. Cl. 358—80 **20 Claims**



1. A system for converting analog video information including first timing signals to digital data-to-control apparatus for reproducing the information, the system comprising:

converter means connected to receive the analog video information supplied thereto for extracting samples of the analog video information and converting the samples to digital data;

converter control means connected to receive at least the first timing signals and in response thereto supply second timing signals after a specified delay to the converter means to control when the converter means extracts samples of the analog video inforation;

storage means connected to the converter means for storing the digital data therefrom;

microcontroller means connected to the converter control means to provide data indicative of the specified delay and connected to the storage means for processing the data in the storage means according to a stored program in the microcontroller means; and

interface means connected to the microcontroller means for receiving the processed data therefrom and supplying it to the apparatus for reproducing the information.

17. A method for converting from a pixel of a first three-color system to a second-color system which includes three colors and black comprising:

providing a measure of the intensity of each of three colors of the pixel;

generating a color look-up table defining a desired relationship between measures of intensity of the first three-color system and desired intensity of the second color system;

converting from the measured intensity of the first three-color system to desired intensity of the second color system with the color look-up table;

replacing the intensity of whichever color of the second color system has the least intensity with that same intensity of black;

removing intensity from each of the two remaining colors in an amount equal to the intensity of black;

adding intensity back to the two remaining colors to thereby create a specified intensity for each of the colors and black;

generating a threshold table defining a threshold intensity for each color and black at which a bilevel display device having a limited plurality of colors will print an appropriate one of the limited plurality of colors;

comparing the resulting intensities of each color of the second color system and black with the threshold intensity from the threshold table; and

printing an appropriate one of the colors or black if the specified intensity of that color or black is in a defined relationship to the threshold intensity.

4,680,627

APPARATUS FOR CHECKING PATTERNS ON PRINTED CIRCUIT BOARDS

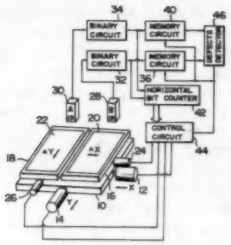
Akira Sase, Katsuta; Takeo Nagata, Hitachi; Masao Fukunaga; Yutaka Sakurai, both of Katsuta, and Yoshikatsu Satomi, deceased, late of Mito, by Fumiko Satomi, legal representative, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,713

Claims priority, application Japan, Mar. 19, 1985, 60-55205

Int. Cl.[4] H06N 7/18

U.S. Cl. 358—101 **12 Claims**



1. An apparatus for checking patterns on printed circuit boards comprising:

inspection table means for fixing thereon at least two printed circuit boards on which patterns to be compared with each other are formed;

imager means for imaging the respective patterns on the respective printed circuit boards;

display means for displaying images of the patterns imaged by said imager means; and

comparing means for comparing said images of the patterns,

said printed circuit boards each having registration patterns each including orthogonal straight line segments,

said apparatus further comprising registration means for matching images of the registration patterns formed on the respective printed circuit boards and displayed on said display means.

4,680,628

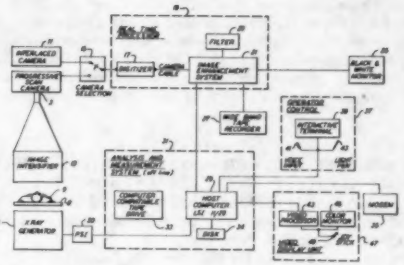
REALTIME DIGITAL DIAGNOSTIC IMAGE PROCESSING SYSTEM

David R. Wojcik, Woburn; Richard J. Jones, Winchester, and James M. Aufiero, Reading, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 4, 1984, Ser. No. 568,013

Int. Cl.[4] H04N 5/32

U.S. Cl. 358—111 **29 Claims**



1. Apparatus for processing a fluoroscopic image comprising:

a. a television camera operating at a frame rate of at least 30 frames per second providing an analog video output;

b. means to digitize series of individual frames of said analog video output to provide frames of digital image information representative of the analog signal;

c. a plurality of frame processors coupled in series for carrying out arithmetic and logical operations on said frames of digital image information coupled to receive the output of said digitizer;

d. a 2-D digital finite impulse response filter operable on said individual frames of digital image information coupled to said frame processors;

e. means to convert frames of digital image information processed in said frame processors and 2-D filter back into frames of an analog signal; and

f. a television display coupled to the output of said means to convert for displaying said processed signal.

4,680,629

DISPLAY UNIT

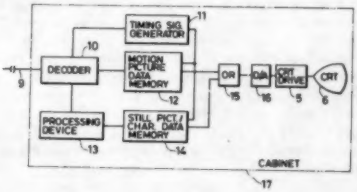
Nobuo Fukushima, Nagasaki, and Shuji Iwata, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,412

Claims priority, application Japan, Feb. 28, 1984, 59-38313

Int. Cl.[4] H04N 7/087, 7/08

U.S. Cl. 358—147 **1 Claim**



1. A display unit comprising: a decoder receiving on an output terminal a signal containing motion picture, still picture and character data and command data in a multiplex mode; a motion picture data memory, said decoder applying said mo-

tion picture data directly to an input of said motion picture data memory; a still picture and character data memory; a processing device receiving still picture and character data from said decoder for processing said still picture and character data and applying said still picture and character data to said still picture and character data memory; timing means, responsive to an output of said decoder, for controlling read-out of contents of said motion picture data memory and said still picture and character data memory; an OR gate receiving on first and second inputs thereof outputs of said motion picture data memory and said still picture and character data memory, respectively in accordance with operation of said timing means; a digital-to-analog converter receiving on an input thereof an output of said OR gate; a CRT drive circuit receiving on an input thereof an output of said digital-to-analog converter; and a CRT driven by said CRT drive device.

4,680,630

APPARATUS FOR PROCESSING DIGITAL VIDEO SIGNALS TO PRODUCE A TELEVISION IMAGE BY LINE AND FIELD SEQUENTIAL SCANNING

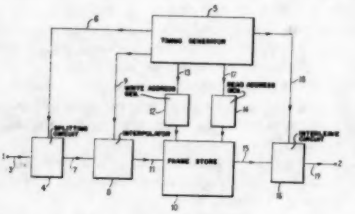
Anthony J. Field, Cambridge, Great Britain, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 11, 1985, Ser. No. 775,065

Claims priority, application United Kingdom, Sep. 14, 1984, 8423323

Int. Cl.[4] H04N 5/14, 9/75

U.S. Cl. 358—160 **7 Claims**



1. Apparatus for processing input video signals having the form of digitally encoded samples and being arranged so that sucessive samples produce a television picture on a display screen by line and field sequential scanning: the apparatus comprising a field store; a first address generator for generating a set of addresses for adressing memory locations in the field store, the set of addresses being generated from input signals defining a given geometrical modification of the television picture represented by the input video signal samples; an interpolator for receiving said input video signals and producing interpolated samples in response to said input signals defining the given geometrical modification, said first address generator being effective to assign to each interpolated sample, one of said memory locations indicated by one of said addresses of said set of addresses; and a second address generator for generating addresses of at least a selected part of the field store to enable said interpolated samples to be read from the locations of the selected part of the field store to form a series of video signal samples which represent a modified television picture: characterized in that said apparatus further comprises a sample generator for producing, from the input video signal samples, samples which occur at twice the rate at which samples are written into the field store, and means for suppling the generated samples to the interpolator twice in each input line scanning period, that the field store comprises at least two parts, a first part for storing odd numbered samples of each output video line of a field and a second part for storing even numbered samples of each output video line of the field; that said set of addresses generated by said first address generator comprises a first sub-set which assigns said interpolated samples to the first part of the field store and a second sub-set which assigns said interpolated samples to the second part of said field store; and that said apparatus still further comprises means for supplying to an output said sucessive samples read from locations of the field store indicated by the second address generator such that said successive samples at the output are derived alternately from the first part and the second part.

4,680,631

TELEVISION COMPOSITE VIDEO SIGNAL PROCESSING CIRCUIT

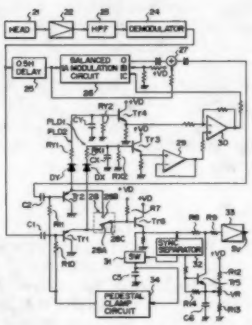
Motoi Yagi, Zushi, and Tadao Miyabayashi, Tokyo, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,976

Claims priority, application Japan, Sep. 19, 1984, 59-196219; Sep. 29, 1984, 59-204916

Int. Cl.[4] H04N 5/14

U.S. Cl. 358—160 **26 Claims**



1. A television composite video signal processing circuit for producing a television composite video signal for image display, comprising:

a reproduction circuit for deriving a reproduction signal which is obtained by repeatedly reading out a composite video signal of one field from a video signal memory means to constitute a composite video signal for displaying a one-frame image in accordance with a ½ interlaced scanning procedure, wherein said reproduction circuit is arranged so that said composite video signal includes peak levels above a certain pedestal level, and a sync tip level below said pedestal level;

0.5H delay means, constituted by a charge-coupled device, for delaying the reproduction signal from said reproduction circuit by ½ of a horizontal sync period;

signal selecting means for alternately passing therethrough a delayed reproduction signal from said delay means and the reproduction signal from said reproduction circuit for every field;

pedestal clamp means for selectively setting pedestal levels of the delayed reproduction signal from said delay means and the reproduction signal from said reproduction circuit to match the pedestal levels with each other on accordance with an output signal from said signal selecting means;

peak level correction means for correcting a peak level of one of a delayed video signal of the delayed reproduction signal from said delay means, and a nondelayed video signal of the nondelayed reproduction signal from said reproduction circuit, in accordance with a peak level difference between the delayed and nondelayed video signals to match the peak levels of the delayed and nondelayed video signals with each other; and

sync tip level setting means for setting to a preset potential sync tip levels of the delayed and nondelayed reproduction signals which are supplied from said delay means and

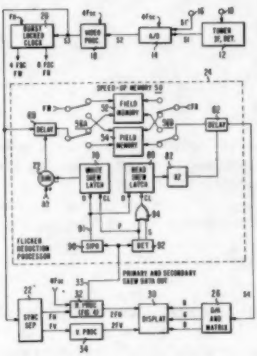
said reproduction circuit through said signal selecting means.

4,680,632

TELEVISION DISPLAY SYSTEM WITH FLICKER REDUCTION PROCESSOR HAVING BURST LOCKED CLOCK AND SKEW CORRECTION

Donald H. Willis, Indianapolis; Russell T. Fling, Noblesville, and Todd J. Christopher, Indianapolis, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 761,215
Int. Cl.[4] H04N *7/01*
U.S. Cl. 358—166 **6 Claims**



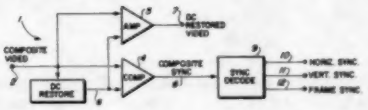
1. In a television display system of the type comprising:
(a) a video source for providing a video input signal of a given line rate and a given field rate;
(b) a clock source for providing read and write clock signals;
(c) memory means connected to said sources and responsive to said write clock signal for storing at least one field of said video signal and responsive to said read clock signal for providing a video output signal having a field rate N-times said given field rate and a line rate at least N-times said given line rate, N being an integer greater than unity; and
(d) display means coupled to said memory means for displaying said video output signal;
the improvement comprising:
(e) means for applying said video input signal to said clock source for synchronizing said clock signals at integer multiples of the frequency of a color subcarrier component of said video input signal;
(f) skew generator means responsive to at least said write clock signal and to a horizontal synchronizing component of said video input signal for providing a write clock skew indicating signal of each line stored in said memory means and a read clock skew indicating signals for each line recovered from said memory means signal; and
(g) means coupled to said memory means and to said skew generator means for imparting an effective delay to each line of said video output signal as a function of a difference between said skew indicating signals; and wherein said delay means comprises:
first circuit means for storing said write clock skew indicating signal with each line of said at least one field of said video input signal in said memory means;
second circuit means for recovering said write clock skew indicating signal from said memory means;
third means for subtracting the recovered write clock skew indicating signal from said read clock skew indicating signal to form a difference signal; and
fourth means for delaying said video output signal as a function of said difference signal.

4,680,633

CIRCUIT AND METHOD FOR PRODUCING ACCURATE DC RESTORED VIDEO WAVEFORM, HORIZONTAL SYNC PULSES, AND VERTICAL SYNC PULSES

Richard C. Gerdes, and Peter R. Vokac, both of Tucson, Ariz., assignors to Third Domain, Inc., Tucson, Ariz.

Filed Apr. 24, 1985, Ser. No. 726,624
Int. Cl.[4] H04N *5/04, 5/16*
U.S. Cl. 358—171 **17 Claims**



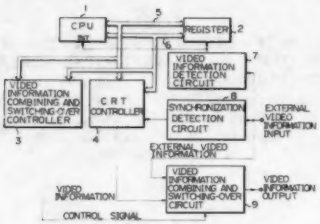
1. A method of operating a video circuit comprising the steps of:
(a) applying a first signal, which is a composite video signal, to a negative input of a first differential amplifier and to an input of a negative sensing peak sense and hold circuit, to produce a first DC reference voltage that is equal to the negative sync tip voltage of the first signal;
(b) applying the first DC reference voltage to the positive input of the first differential amplifier to cause the first differential amplifier to produce a second signal that is an inverted replica of the first signal and has its level shifted so that the voltage of a sync tip portion of the second signal is equal to a ground reference voltage;
(c) applying the second signal to a negative input of a second differential amplifier;
(d) sensing the voltage of the second signal during a back porch portion thereof and producing a second DC reference voltage representative of the voltage of the back porch portion of the second signal;
(e) applying the second DC reference voltage to the positive input of the second differential amplifier and a fraction of the second DC voltage to the positive input of a comparator;
(f) coupling the output of the second differential amplifier through a diode to the negative input of the comparator to cause the comparator to produce a composite sync signal containing a series of narrow negative going pulses during a pre-equalization portion thereof followed by a plurality of narrow serration pulses during a vertical sync pulse interval portion thereof;
(g) applying the composite sync signal to a first monostable multivibrator and to an input of a first latch;
(h) causing an output of the first monostable multivibrator to produce pulses which are wider than the narrow negative-going pulses during the pre-equalization period of the composite sync signal but narrower than the interval between the serration pulses; and
(i) clocking the first latch with a trailing edge of the output pulses produced by the first monostable multivibrator in order to produce a jitter-free vertical sync signal that undergoes a jitter-free transition in response to a transition between the pre-equalization portion and the vertical sync pulse interval portion of the composite sync signal.

4,680,634

SYSTEM FOR PROCESSING PICTURE INFORMATION

Keiichiro Nanba; Satoru Tokui, and Tatsuro Onuma, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,560
Claims priority, application Japan, Oct. 21, 1983, 58-197455
Int. Cl.[4] H04N *5/268*
U.S. Cl. 358—181 **3 Claims**



1. A system for processing a picture information signal generated by a picture information signal generation operation and an external video signal supplied from an external video source, comprising:

a central processing unit for executing programs including a program for generating said picture information signal;

input means for receiving said external video signal;

external video signal detection means connected to said input means, for generating a detection signal when said external video signal is present at said input means;

register means connected to said central processing unit and said external video signal detection means for temporarily storing said detection signal from said external video signal detection means;

control means connected to said central processing unit and responsive to said detection signal for generating a control signal; and

output means receiving said picture information signal and said external video signal and responsive to said control signal, for supplying at least said external video signal to an output thereof and in response to the absence of said control signal for selectively supplying said picture information signal to said output whereby said central processing unit selectively controls said output means

wherein said central processing unit comprises:

an interrupt terminal for receiving said detection signal;

said central processing unit operable for reading a content of said register means for operating said control means to supply said control signal to said output means so that said picture information signal and said external video signal are combined at said output means when said detection signal is present in said register means, and operating said control means to stop said control signal so that said picture information signal is output from said output means when said detection signal is not present in said register means.

4,680,635

EMISSION MICROSCOPE

Neeraj Khurana, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

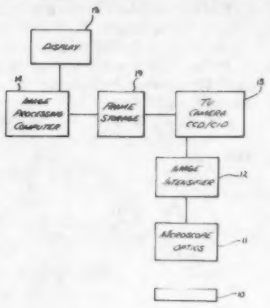
Filed Apr. 1, 1986, Ser. No. 846,874
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—211 **24 Claims**

1. A microscope comprising:

optical means comprising first and second lenses, said second lens for reducing the magnification of said first lens, said optical system outputting an optical image;

intensifier means coupled to said optical means, said intensifier means for intensifying said optical image and outputting an intensified image;

camera means coupled to said intensifier means for converting said intensified image to an electronic image signal;



processing means coupled to said camera means for removing noise from said electronic image signal and enhancing said electronic image signal;

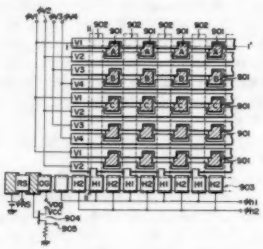
display means coupled to said processing means for displaying a display image generated from said electronic image signal.

4,680,636

DRIVER CIRCUIT FOR TWO-DIMENSIONAL IMAGE SENSOR

Kazushige Ooi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 12, 1985, Ser. No. 797,019
Claims priority, application Japan, Nov. 13, 1984, 59-237556
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.18 **22 Claims**



1. A driver circuit for an image sensor operating in a field storage mode in which field shifting including even field shifting and odd field shifting is carried out, said image sensor having a two-dimensional optical area including photo-sensitive elements providing signal charges representing an image formed on said optical area, and having register means for transferring the signal charges from said photosensitive elements to outside of said image sensor in accordance with given signals provided thereto, said register means including vertical transmission register means for transferring signal charges along the vertical direction of said two-dimensional optical area, said driver circuit comprising:

generator means for generating and providing said given signals to said register means, said given signals including vertical driving signals applied to said vertical transmission register means to transfer signal charges along the vertical direction, each of said vertical driving signals including field shift pulses effecting said even or odd field

shifting and including line shift pulses effecting line shifting which is repeated during field shifting;

circuit means, coupled to said generator means, for stopping signal charge transferring by said register means for a given period of time, so that the amplitude of a first signal component of said given signals used for even field shifting substantially matches the amplitude of a second signal component contained in said given signals used for odd field shifting;

wherein said vertical driving signals comprise a first vertical driving signal which is applied to first horizontal arrays of said photo-sensitive elements, and a second vertical driving signal which is applied to second horizontal arrays of said photo-sensitive elements; and

wherein said circuit means includes potential adjusting means for adjusting said second vertical driving signal such that the potential of said second vertical driving signal substantially matches that of said first vertical driving signal for a fixed period within said given period of time.

4,680,637

CCD AREA SENSOR WITH LOW SIGNAL LEVEL VARIATION

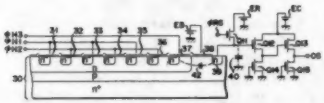
Tadashi Sugiki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 30, 1985, Ser. No. 814,376

Claims priority, application Japan, Jan. 14, 1985, 60-4368

Int. Cl.[4] H04N *5/21, 3/15*

U.S. Cl. 358—213.26 **12 Claims**



1. A solid-state image sensor comrising:

an optical area formed of photosensitive elements which provide signal charges representing an image detected by said optical area, and

register means for transferring the signal charges from said photosensitive elements to an output region of said image sensor in accordance with given pulses, said register means including:

horizontal register means for providing an image sensor output representing the image detected by said optical area, said horizontal register means having horizontal transfer electrodes and a final stage electrode independent of said horizontal transfer electrodes, said final stage electrode being arranged between said horizontal transfer electrodes and said output region from which said image sensor outut is obtained;

first circuit means for supplying said horizontal transfer electrodes with a first signal of horizontal driving pulses so that signal charge transferring is performed, said first signal of horizontal driving pulses having a prescribed blank period during which no horizontal driving pulses are present; and

second circuit means for supplying said final stage electrode with a final stage driving pulse signal which includes horizontal driving pulses generated when said horizontal driving pulses appear in said first signal and during said prescribed blank period of said first signal.

4,680,638

CONCEALMENT OF DEFECTS IN A VIDEO SIGNAL

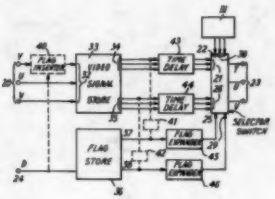
Ian Childs, Sutton, England, assignor to British Broadcasting Corporation, London, England

Filed Jul. 14, 1983, Ser. No. 513,680

Claims priority, application United Kingdom, Jul. 16, 1982, 8220619

Int. Cl.[4] H04N *9/04*

U.S. Cl. 358—214 **24 Claims**



1. A telecine machine provided with apparatus for concealing defects in an input video signal from said machine, said apparatus comprising:

input means for receiving an input video signal representing a film area of a film frame;

video store means coupled to said input means for storing the input video signal to provide a stored video signal representing a different film area;

blemish signal deriving means for deriving a first blemish signal indicating the presence of a blemish on the film area represented by the input video signal;

blemish signal storing means for storing the first blemish signal to provide a stored blemish signal associated with the stored video signal; and

selection means for providing an output video signal in dependence upon said first blemish signal and said stored blemish signal, said selection means being operative such that:

in the absence of said first blemish signal the input signal is selected as the output signal, and

in the presence of the first blemish signal the stored video signal is normally substituted therefor, and

suppression means responsive to the stored blemish signal to control the selection means to suppress substitution of the stored video signal into the input video signal.

4,680,639

VIEWFINDER FOR TV CAMERA USE WITH MEANS FOR ENHANCING THE CONTRAST LEVEL OF THE VIEWFINDER IMAGE

Haruo Isono; Hideo Kusaka, and Takeshi Hasegawa, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Japan

Filed Aug. 1, 1985, Ser. No. 761,505

Claims priority, application Japan, Aug. 9, 1984, 59-165583

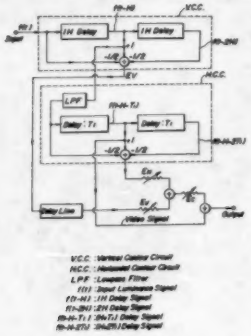
Int. Cl.[4] G03B *13/02*

U.S. Cl. 358—224 **4 Claims**

1. A viewfinder for a TV camera in which a contour of a viewed picture is emphasized so as to correspond to the sharpness corrected for the spatial frequency performance of a visual system at close viewing distance of about three times of a screen height, comprising:

at least one contour signal forming means for forming a contour signal representing said contour by subtracting each of respective halves of non-delayed and full-delayed picture signals from a half-delayed picture signal respectively obtained through a series connection of first and second delay circuits individually having delay time related to a screen size of said viewfinder, said series connection being applied with an input picture signal, said input signal, an output of said first delay circuit, and an

output of said second delay circuit providing said non-delayed, half-delayed and full-delayed picture signals, respectively;



wherein said at least one contour signal forming means is provided for at least the horizontal scanning direction of the viewing screen.

4,680,640

APPARATUS FOR REDUCING BEAM CURRENT MEASUREMENT ERRORS

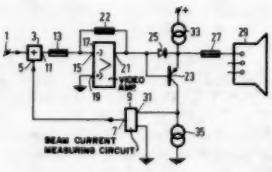
Pieter G. Blanken, and Pieter van der Zee, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,628

Claims priority, application Netherlands, Mar. 6, 1985, 8500622; Sep. 27, 1985, 8502636

Int. Cl.[4] H04N *5/68*

U.S. Cl. 358—243 **4 Claims**



1. A picture display device comprising a picture display tube a cathode of which is coupled to the emitter of an emitter-follower drivable by a video amplifier, a negative feedback signal input of the video amplifier being coupled to an input of the emitter-follower and the collector of the emitter-follower being coupled to an input of a beam current measuring circuit, while an anti-blocking circuit is coupled to the cathode of the picture display tube to prevent blocking of the beam current measuring circuit due to leakage currents in the picture display tube, characterized in that the anti-blocking circuit is a circuit producing an emitter-follower current of the order of magnitude of at least approximately one hundred micro-amperes, while a current source is coupled to the input of the beam current measuring ciruit for draining the emitter-follower current produced by the anti-blocking circuit.

4,680,641

IMAGE PROCESSING SYSTEM

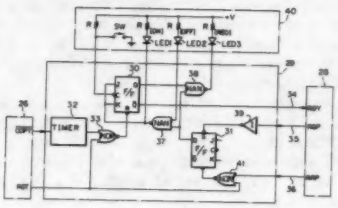
Tamotsu Nakazawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,724

Claims priority, application Japan, Jul. 28, 1984, 59-158281

Int. Cl.[4] H04N *1/32*

U.S. Cl. 358—257 **8 Claims**



1. An image processing system comprising:

read means for reading an image and producing an electrical image signal;

print means for printing an image; and

mode selection means for selecting between an off-line mode for printing the image by said print means in accordance with the electrical image signal from said read means and an on-line mode for printing the image by said print means in accordance with another image signal, wherein said mode selection means preferentially selects the on-line mode.

4,680,642

PICTURE SCANNING AND RECORDING METHOD WITH SELECTION BETWEEN TWO DIFFERENTLY PROCESSED SIGNALS

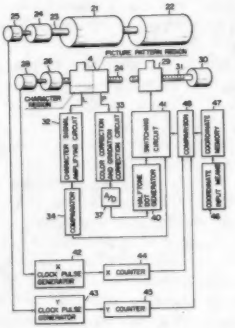
Noriyuki Shimano; Isao Tokura, both of Uji, and Mitsuhiko Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 1, 1984, Ser. No. 616,389

Claims priority, application Japan, Jun. 7, 1983, 58-100236

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—280 **5 Claims**



1. A picture scanning and recording method, wherein said method includes:

placing an original picture, having a plurality of regions, on a recording drum,

arranging a plurality of photodetectors to detect each region of the original picture,

scanning photoelectrically the original picture and generating a plurality of picture signals and pulse values,

processing each picture signal into at least two different processed signals,

and selecting, depending upon a comparison of the pulse value and preset data stored in a memory, which processed signal is to be outputted to a recording head.

4,680,643

IMAGE DISPLAY APPARATUS

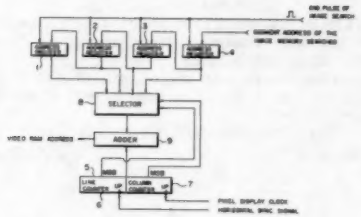
Toshio Horiguchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 711,921

Claims priority, application Japan, Mar. 19, 1984, 59-51079

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—280 **4 Claims**



1. An image display apparatus for simultaneously displaying a plurality of selected separate images on one screen of a video display, comprising;

image data segment address-storing means for storing respective segment addresses of a plurality of selected image data stored in an image memory file, said segment address storing means is formed by a plurality of address registers of which an output of a front address register stage thereof is cascade connected to an input of the next address register stage thereof; and

image display memory address-forming means for selectively taking-out said stored segment addresses and forming image display memory addresses of an image display memory for one picture plane on which said plurality of selected image date are to be combined and simultaneously displayed, said segment address storing means is configured in a manner such that a segment address of new image data to be displayed subsequently to an image presently being displayed is input to the address register at the forefront stage, and a load pulse is applied to all of said address registers upon completion of the selection of said new image data and the content of each of said address registers is sequentially changed,

wherein contents of said image memory file in which said plurality of selected image data are stored are read-out on the basis of said image display memory addresses whereby said plurality of selected image data are simultaneously displayed on one screen of a video display means.

4,680,644

METHOD AND APPARATUS FOR READING AN IMAGE

Yoshiaki Shirato, Machida; Toshiyuki Komatsu, Yokohama; Shinichi Seito, Isehara; Tatsundo Kawai, Hiratsuka; Hirofumi Iwamoto, Machida; Katsumi Nakagawa, Kawasaki, and Yasuo Kuroda, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,797

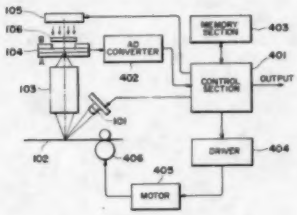
Claims priority, application Japan, Jul. 23, 1984, 59-151379; Jul. 23, 1984, 59-151383

Int. Cl.[4] H04N *1/024*

U.S. Cl. 358—294 **18 Claims**

1. An image reading method in which a light obtained through an object to be read is converted into an electric signal by a photoelectric converting means having opposed first and second surfaces and performing a reading, said method comprising the steps of:

allowing a light for compensation to illuminate the second surface of said photoelectric converting means to cause a signal for compensation to be generated therefrom; and



performing a reading of an image by illumianting the first surface of said photoelectric converting means and compensating the resulting read signal by use of said compensation signal.

4,680,645

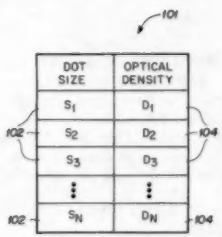
METHOD FOR RENDERING GRAY SCALE IMAGES WITH VARIABLE DOT SIZES

Gary J. Dispoto, Mt. View; Larry R. Mather, Menlo Park, and John D. Meyer, Mt. View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 25, 1986, Ser. No. 899,358

Int. Cl.[4] H04N *1/04, 1/22*; G01D *15/18*

U.S. Cl. 358—298 **6 Claims**



1. A method of generating a gray scale image on a surface comprising a matrix of pixels, the method comprising the steps of:

depositing a first dot of a predetermined size on a selected pixel on the surface;

determining a gray level error of the deposited first dot;

scaling the error and assigning the scaled error to a pixel adjacent to the selected pixel;

determining a size of a second dot in response to the scaled error to provide a second dot of a predetermined size;

depositing the second dot of a predetermined size on the adjacent pixel.

4,680,646
IMAGE FORMING DEVICE FOR REPRODUCING A HALF-TONE IMAGE

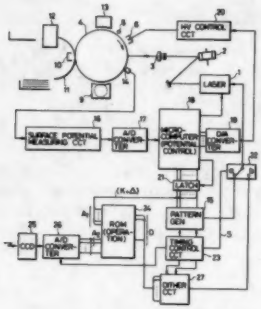
Yoshinori Ikeda, Taira, and Takao Aoki, Abiko, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,083

Claims priority, application Japan, Sep. 5, 1983, 58-162069; Sep. 5, 1983, 58-162070

Int. Cl.[4] H04N *1/21, 1/23, 1/29;* **G01D** *15/14*

U.S. Cl. 358—298 **19 Claims**



1. An image forming device comprising:

recording means for forming an electrostatic latent image on a recording medium according to image data;

developing means for developing said electrostatic latent image;

dot forming means for forming dots on said recording means;

pattern generation means for forming a predetermined half-tone pattern, made of a plurality of dots, with said dot forming means;

detection means for detecting a value of said electrostatic latent image on said recording medium corresponding to a density of said predetermined half-tone pattern; and

correction means for correcting the image data to be recorded by said recording means according to an output from said detection means to control the ratio of the area of the recording portion to the area of the non-recording portion for a predetermined area.

4,680,647
METHOD FOR RECORDING AND REPRODUCING VIDEO FORMAT SIGNAL

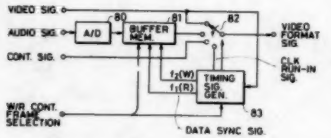
Yoshiaki Moriyama, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,694

Claims priority, application Japan, Sep. 26, 1983, 58-178648; Sep. 26, 1983, 58-178649; Sep. 26, 1983, 58-178651; Sep. 26, 1983, 58-178661

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—343 **17 Claims**



1. A method of recording a video format signal of the type having a plurality of successive line signal portions, with each line signal portion including a horizontal synchronizing signal portion followed by an information signal portion, said video format signal corresponding to a two-dimensional image of a plurality of lines and containing digital data having a predetermined clock timing and synchronizing signals for determining synchronizing timing for detecting said digital data, said method comprising the steps of:

dividing said two-dimensional image into a plurality of blocks each containing at least one line;

generating said video format signal with said digital data included in the information signal portion of said video format signal corresponding to a first of said blocks and with synchronizing signals for determining the synchronizing timing for detecting said digital data in the information signal portion of said video format signal corresponding to a second of said blocks; and

recording said video format signal on a recording medium.

4,680,648
INFORMATION SIGNAL REPRODUCING APPARATUS

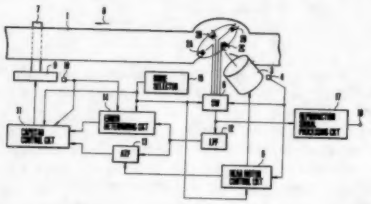
Nobutoshi Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,863

Claims priority, application Japan, Oct. 24, 1983, 58-199783; Oct. 24, 1983, 58-199784

Int. Cl.[4] H04N *5/783;* **G11B** *21/10*

U.S. Cl. 360—10.2 **20 Claims**



1. An information signal reproducing apparatus arranged to reproduce an information signal from recording tracks formed on a record bearing medium one after another in a direction intersecting the moving direction of the record bearing medium with a plurality of kinds of pilot signals repeatedly superimposed on the information signal, comprising:

(a) moving means for moving said record bearing medium in the direction intersecting said recording tracks;

(b) first generating means for generating a first cyclic signal having a cycle corresponding to a moving speed of said moving means performed on the record bearing medium;

(c) reproducing means for reproducing signals from said record bearing medium;

(d) second generating means for generating a second cyclic signal having a cycle corresponding to a recurrent period of one of said plurality of kinds of pilot signals in the signals reproduced by said reproducing means; and

(e) discriminating means for discriminating the pitch of said recording tracks by using the first and second cyclic signals.

4,680,649
BACK-SPACE EDITING CONTROL CIRCUIT FOR ROTARY-HEAD MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 10, 1986, Ser. No. 818,180

Claims priority, application Japan, Jan. 12, 1985, 60-3740

Int. Cl.[4] G11B *27/02;* **H04N** *5/91*

U.S. Cl. 360—14.2 **8 Claims**

1. A back-space editing control circuit for a recording and reproducing apparatus which first assumes an assembly state before actually assuming a recording state when an operation mode of the recording and reproducing apparatus is switched

from a recording pause mode to a recording mode, said recording and reproducing apparatus using a control signal reproduced from a magnetic tape in said assembly state to control a rotational phase of a capstan motor so that information tracks formed on the magnetic tape are accurately scanned until said recording state is reached, said back-space editing control circuit comprising:

vertical synchronizing signal separating means for separating a vertical synchronizing signal from an input video signal;

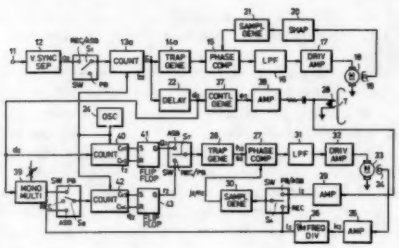
control signal generating means for generating a control signal from an output signal of said vertical synchronizing signal separating means;

control head means supplied with the control signal from said control signal generating means for recording the control signal on the magnetic tape in said recording state and for reproducing the control signal from the magnetic tape in said assembly state and a reproducing mode of the recording and reproducing apparatus;

rotation detecting means for detecting a rotational phase of said capstan motor and for generating a rotation detection signal;

sampling signal producing means for producing a sampling signal, said sampling signal being produced from the control signal which is reproduced by said control head means in said assembly state and being produced from said rotation detection signal in said recording state;

trapezoidal wave signal producing means for producing a



trapezoidal wave signal, said trapezoidal wave signal being produced from the output signal of said vertical synchronizing signal separating means in said assembly state and being produced from said rotation detection signal in said recording state, said trapezoidal wave signal producing means comprising oscillator means for generating a signal having a constant frequency, first and second counters for counting the output signal of said oscillator means, said first counter being reset by the output signal of the vertical synchronizing signal separating means and producing first and second output signals when a counted value reaches first and second threshold values, respectively, said second counter being reset by a signal based on said rotation detection signal in said assembly state and running free with a predetermined frequency in said recording state to produce third and fourth output signals when a counted value reaches third and fourth threshold values, respectively, a square wave signal generating circuit for generating a square wave signal which rises and falls responsive to the first and second output signals of said first counter in said assembly state and responsive to the third and fourth output signals of said second counter in said recording state, and a trapezoidal wave generating circuit for generating the trapezoidal wave signal from the output square wave signal of said square wave signal generating circuit; and

driving and control means for comparing phases of the trapezoidal wave signal from said trapezoidal wave signal producing means and the sampling signal from said sampling signal producing means to produce a phase error signal and for driving and controlling the rotational phase of said capstan motor by use of said phase error signal.

4,680,650

MAGNETIC VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

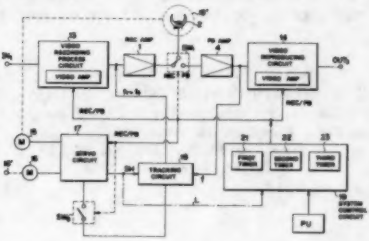
Takao Miyazaki, and Hideo Yamamoto, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed May 8, 1985, Ser. No. 732,203

Claims priority, application Japan, May 16, 1984, 59-99300

Int. Cl.[4] G11B *21/10, 5/588, 15/18*

U.S. Cl. 360—33.1 **6 Claims**



1. A magnetic recording system in a video tape recorder capable of operating in recording and reproduction modes, comprising:

a video recording process circuit which has a first video amplifier and which transmits input video signals to video heads so that said video heads record the video signals on a magnetic tape when the video tape recorder is in the recording mode;

a video reproduction process circuit which has a second video amplifier and which receives video signals reproduced from the magnetic tape by said video heads when the video tape recorder is in the reproduction mode;

a servo circuit which controls a cylinder driving motor for driving a rotary cylinder having thereon said video heads and which controls a capstan motor adapted to drive a capstan, movement of said capstan effecting movement of the magnetic tape;

an automatic tracking circuit which supplies said servo circuit with an auto tracking signal, said servo circuit controlling said capstan motor in response to said auto tracking signal; and

a system control circuit which controls said video recording process circuit, said video reproduction process circuit, said servo circuit and said automatic tracking circuit;

wherein said system control circuit includes first, second and third timers which respectively time first, second and third time intervals, and means responsive to actuation of a pause button of the video tape recorder when the video tape player is in the recording mode for causing said first and second video amplifiers and said servo circuit to be changed from a recording mode to a reproduction mode, for activating said first timer and causing said capstan motor to rotate said capstan in a reverse direction for said first time interval of said first timer in order to move the video tape back by a predetermined distance and for stopping said capstan motor after expiration of said first time interval, and means responsive to deactuation of said pause button for causing said capstan motor to resume rotation in a forward direction so as to transport the tape in a forward direction, for activating said second timer and for causing said servo circuit to change back into its recording mode on expiration of said second time interval, said automatic tracking circuit establishing auto tracking during said second time interval, and means for activating said third timer upon expiration of said second timer and

for causing said video amplifiers to change back into their recording mode upon expiration of said third time interval; and

wherein said auto tracking circuit includes: a four-frequency signal generator which produces four pilot signals of different frequency, said video recording process circuit superposing said pilot signals on said video signals; means for extracting said pilot signals from signals reproduced from the magnetic tape by said video heads; balance-modulating means for balance-modulating the extracted pilot signals and the pilot signals from said four-frequency signal generator; and means responsive to an output signal of said balance-modulating means representative of a tracking error for producing said auto tracking signal.

4,680,651

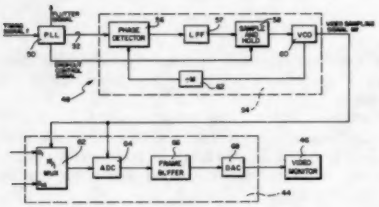
TIMING SIGNAL DROPOUT COMPENSATION CIRCUIT

Kurt V. Blessinger, Cardiff-By-The-Sea, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1986, Ser. No. 897,890

Int. Cl.[4] H04N *5/93, 5/782*

U.S. Cl. 360—38.1 **4 Claims**



1. In video reproduction apparatus in which video information is recorded in a plurality of longitudinal video tracks on recording media, and in which a timing signal is recorded in a timing track parallel to the video information tracks, timing signal dropout compensation circuit comprising:

means for reproducing a timing track signal from said timing track on said recording media at it is moved past said reproducing means, wherein said timing signal is susceptible to changes in frequency caused by variations in speed of said recording media as it is moved past said reproducing means;

first phase lock loop (PLL) circuit means for producing a first phase locked timing signal which is phase locked to and has the same frequency as said timing track signal reproduced from said media, said first PLL circuit means including means for producing a dropout control signal which is a function of a loss of lock of said reproduced timing track signal caused by a dropout in said timing track signal;

second phase lock loop circuit means for producing a video sampling signal which is used in the reproduction of said video information from said media and which is phase locked to said first phase locked timing signal and which has a frequency which is a multiple of said first phase locked timing signal, said second PLL circuit means being responsive to said dropout control signal produced by said first PLL circuit means to continue to produce said video sampling signal during the period of said timing track signal dropout;

wherein said first and second PLL circuit means have loop bandwidths which are sufficient to follow frequency variations in the timing track signal reproduced from the recording media without loss of lock of the timing track signal.

4,680,652

DEVICE FOR DETECTING A SPACE BETWEEN ADJACENT BLOCKS OF DATA RECORDED IN A RECORDING MEDIUM

Takeshi Ito, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki, Kawasaki, Japan

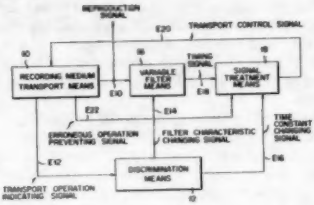
Continuation of Ser. No. 361,789, Mar. 25, 1982, Pat. No. 4,442,464, which is a continuation of Ser. No. 151,916, May 21, 1980, abandoned. This application Nov. 16, 1983, Ser. No. 552,437

Claims priority, application Japan, May 24, 1979, 54-64191

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.[4] G11B *15/16, 15/52, 19/10*

U.S. Cl. 360—72.1 **17 Claims**



1. A detector for detecting a space between adjacent blocks of data recorded on a recording medium, said detector comprising:

(a) recording medium transport means having several operation modes, for transporting a recording medium at different speeds, for providing a reproduction signal corresponding to data recorded on said recording medium and for issuing a transport operation indicating signal identifying the operation mode of said transport means;

(b) means for discriminating said transport operation indicating signal and for providing a filter characteristic changing signal in accordance with said transport operation indicating signal;

(c) variable filter means, repsonsive to said filter characteristic changing signal, for filtering said reproduction signal and for providing a timing signal, the filtering characteristic of said variable filter means changing in accordance with said filter characteristic changing signal; and

(d) signal treatment means, coupled to said discriminating means and responsive to said timing signal, for generating a transport control signal to change the operation mode of the recording medium transport means.

4,680,653

ROTATING STORAGE DEVICE TRACK FORMAT EMULATION

Chan Y. Ng; Norman K. Ouchi; David T. Wang, all of San Jose, Calif., and Wellington C. Yu, Wing On Life Garden, Singapore, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1986, Ser. No. 866,632

Int. Cl.[4] G11B *5/012*

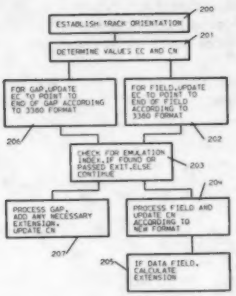
U.S. Cl. 360—72.2 **17 Claims**

1. A method for locating a record in response to location information generated according to a first recording format on a moving storage device operating according to a second recording format, comprising the steps of:

determining an original angular position of the record according to the first recording format from the location information;

calculating in response to the original angular position and a parameter a preferred angular position for the record according to the second recording format;

determining an actual angular position of the record recorded according to the second recording format; and


200
ESTABLISH TRACK ORIENTATION
201
DETERMINE VALUES EC AND CN
FOR GAP, UPDATE EC TO POINT TO END OF GAP ACCORDING TO 3360 FORMAT
FOR FIELD, UPDATE EC TO POINT TO END OF FIELD ACCORDING TO 3360 FORMAT
206
202
CHECK FOR EMULATION INDEX. IF FOUND OR PASSED EXIT, ELSE CONTINUE
203
204
PROCESS GAP, ADD ANY NECESSARY EXTENSION, UPDATE CN
PROCESS FIELD AND UPDATE CN ACCORDING TO NEW FORMAT
207
205
IF DATA FIELD, CALCULATE EXTENSION

processing an extension of the record to compensate for the difference between the preferred angular position and the actual angular position.

4,680,654

LID LOCKING MECHANISM FOR AN AUTOMATIC TAPE CASSETTE LOADING AND UNLOADING APPARATUS

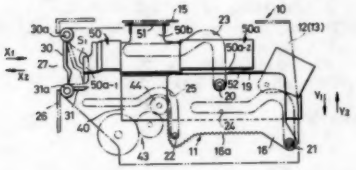
Kazunori Shibuya, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Oct. 3, 1984, Ser. No. 657,359

Claims priority, application Japan, Oct. 5, 1983, 58-154668

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—96.5 **6 Claims**



1. A lid locking mechanism for a lid of an automatic tape cassette loading and unloading apparatus, said automatic tape cassette loading and unloading apparatus comprising a tape cassette inserting opening through which a tape cassette is inserted, said tape cassette inserting opening having a horizontally elongated shape, a lid for covering said tape cassette inserting opening in a vertically hanging position thereof and for uncovering said tape cassette inserting opening in a substantially horizontal position thereof, said lid being rotatable about an imaginary center line which extends along an upper edge of said tape cassette inserting opening, said lid assuming the substantially horizontal position when pushed by the tape cassette which is inserted through said tape cassette inserting opening, a tape cassette holder for accommodating and holding the tape cassette which is inserted through said tape cassette inserting opening, and holder moving means for moving said tape cassette holder between first and second positions, said tape cassette holder opposing said tape cassette inserting opening in said first position, said second position being lower than said first position, said lid locking mechanism comprising:

a rotatable locking member for locking said lid so as to prevent said lid from uncovering said tape cassette inserting opening when said rotatable locking member assumes a first rotational position, said rotatable locking member opposing a rear surface of said lid which is in the vertically hanging position and blocking said lid from rotating to the substantially horizontal position when said rotatable locking member assumes said first rotational position; and

a support mechanism for rotatably supporting said rotatable locking member, said support mechanism being located at a position higher than said tape cassette inserting opening,

said rotatable locking member having an edge remote from said support mechanism which rests on the tape cassette holder such that said rotatable locking member rotates upwardly to a second rotational position when the tape cassette holder moves to said first position, said rotatable locking member being eccentrically supported by said support mechanism such that said rotatable locking member moves to said first rotational position under its own weight when the tape cassette holder moves from the first position to the second position, said rotatable locking member being displaced from a position opposing the rear surface of said lid, which is in the vertically hanging position, when said rotatable locking member assumes said second rotational position.

4,680,655

DISK SUPPORTING DEVICE

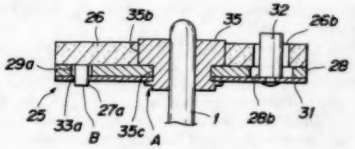
Katsuyuki Sugawara, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 24, 1986, Ser. No. 822,061

Claims priority, application Japan, Jan. 24, 1985, 60-8945[U]

Int. Cl.[4] G11B *17/02*

U.S. Cl. 360—97 **7 Claims**



1. In a magnetic disk supporting device for a magnetic recording and playback apparatus including an annular table, an annular yoke and a generally annular leaf spring which are disposed one upon another and surround an upright shaft extending from a disk driving unit, and a disk drive pin upstanding from said leaf spring, extending through said yoke and said table and having an upper end projecting above said table, the improvement which comprises a bush surrounding said shaft adjacent to the top thereof and secured thereto, said table, yoke and leaf spring being fitted about said bush and held together by said bush, said table having a plurality of bosses which position it relative to said leaf spring, said table being formed from a magnetic material.

4,680,656

PLURAL-DISK ROTATABLE DISK MEMORY WITH AIR CIRCULATION SYSTEM

Klaus Manzke, Westheim; Richard Schneider, Heidelberg, and Lambert Kohl, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 513,250, Jul. 13, 1983, abandoned. This application Sep. 15, 1986, Ser. No. 908,872

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 8220180[U]

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—98 **6 Claims**

1. A rotatable disk memory apparatus comprising

a substantially sealed housing having a bottom section and a top section with joints therebetween,

in said housing a substantially thimble-shaped hub mounting a plurality of mutually spaced disks for rotation with said

hub, said disks forming together with said hub a disk assembly,

a drive shaft secured to said hub,

motor means mounted outside of said housing for rotating said hub by means of said drive shaft, said shaft being rotatably mounted in bearing means and said bearing means being surrounded by said thimble-shaped hub, and

an air circulating system having air-flow determining elements including

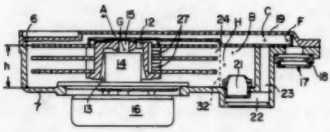
an outer peripheral space adjacent to the disk assembly,

beyond said peripheral space and near the bottom of said housing a vertically downwardly oriented filter means for cleaning the centrifugally driven air,

a low pressure compartment beyond and below said filter means,

a breather filter connecting the interior of the housing to atmosphere,

an air supply channel located near the top of said housing and extending from beyond the filter means to near the center of rotation of the disk assembly, and



a substantially vertically extending duct connecting said low pressure compartment with said supply channel and said breather filter,

the air flow determining elements of said system being designed so that in said peripheral space a first, low air pressure is generated at the bottom of the housing, and a second, higher air pressure near the top of the housing, said joints being located in the zone of said second air pressure near the top of the housing to preclude contaminants from entering into the housing,

orifices being provided in the top side of the thimble-shaped hub for permitting the air supplied through said channel to enter the inside of said thimble-shaped hub, and a third air pressure approximately equal to that of the first air pressure being generated on the inside of the hub adjacent the bearing means whereby the build-up of a considerable negative air pressure, relative to atmosphere, on the inside of the hub is avoided and hence contamination of the inside of the hub by air entering through the bearing means substantially prevented.

4,680,657

METHOD AND APPARATUS FOR REPRODUCING MAGNETICALLY RECORDED SIGNALS WITH A D.C. BIASING MAGNETIC FIELD PRODUCED BY A D.C. BIASING COIL

Hiroichi Naito, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 5, 1985, Ser. No. 773,067

Claims priority, application Japan, Sep. 7, 1984, 59-187359

Int. Cl.[4] G11B *5/335, 5/09*

U.S. Cl. 360—111 **3 Claims**

1. An apparatus for reproducing magnetically recorded signals contained in a magnetic recording medium, comprising:

a magnetic head with a resistance and an inductance, the resistance and the inductance defining an impedance, the magnetic head including a core having a magnetic path;

a D.C. biasing coil mounted on said core;

means for supplying D.C. current to said D.C. biasing coil;

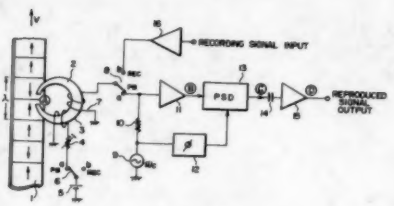
a signal detecting coil mounted on said core;

carrier oscillator means for supplying A.C. current at a predetermined frequency to said signal detecting coil;

an output resistor with a resistance, the resistance of the output resistor being greater than the absolute value of the impedance of the magnetic head, the output resistor being electrically connected in series between said signal detecting coil and said carrier oscillator means;

a phase sensitive detector connected to said signal detecting coil, said output resistor being electrically connected in series between said detector and said carrier oscillator means; and

means for delivering an electrical signal at said predetermined frequency from said carrier oscillator means to said



phase sensitive detector, said electrical signal being in phase with an output signal from said signal detecting coil that is a function of the resistance of the magnetic head;

wherein said phase sensitive detector detects signals from said signal detecting coil that are in phase with the electrical signal from the signal delivering means; whereby an output signal from said signal detecting coil that is a function of the inductance of the magnetic head is undetected, thereby reducing noise.

4,680,658

APPARATUS FOR CORRECTING A TIME BASE ERROR AND FOR COMPENSATING DROPOUTS INCLUDED IN A REPRODUCED VIDEO SIGNAL

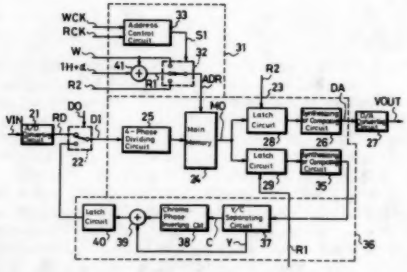
Mitsushige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,079

Claims priority, application Japan, May 26, 1984, 59-107294

Int. Cl.[4] H04N *5/94, 5/95*

U.S. Cl. 360—36.2 **5 Claims**



1. An apparatus for correcting a time base error and for compensating a dropout included in a video signal reproduced from a record medium by using a transducing head comprising:

analog-to-digital converter means for converting the reproduced video signal to a digital video data stream;

a single random access memory means for memorizing said digital video data stream;

correct video data producing circuit means connected to said memory means for producing correct video data from said digital video data stream read out from said memory means;

switching circuit means controlled by a dropout detecting

pulse for selectively supplying said digital video data and said correct video data to said memory; and

control circuit means for controlling a write and read operation of said memory means, said control circuit means having a write address generator for generating a write address signal indicating a write address of said memory at which an output signal of said switching circuit means is written into said memory means upon the generation of said write address signal, a first read address generator for generating a first read address signal indicating a read address of said memory means, said first read address signal being asynchronous with said write address signal so that digital video data memorized in said memory means is read out without said time base error, and a second read address generator for generating a second read address signal generated previous to said generation of said write address signal, said second read address signal indicating an address differing from said write address by a predetermined distance so that said digital video data read out from said memory means is supplied back to said memory means for compensating a dropout via said correct video data producing circuit during a generation of said dropout detecting pulse.

4,680,659

TAPE DRIVE MECHANISM HAVING TORQUE TRANSMITTING GEAR ASSEMBLIES

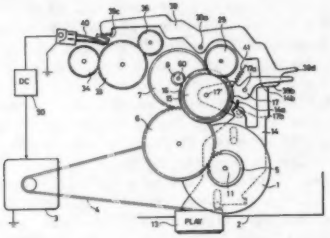
Kaetsu Imai, Maebashi, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 12, 1983, Ser. No. 513,137

Claims priority, application Japan, Jul. 16, 1982, 57-107865[U]

Int. Cl.[4] G11B *5/008, 15/00, 15/32;* **G65H** *16/10*

U.S. Cl. 360—96.3 **5 Claims**



1. A mechanism for tape recording/reproducing apparatus, comprising:

a plurality of manually operated playback, fast-forward and rewind function bars for effecting playback, fast-forward, and rewind operations, each of said bars being movable from a nonworking position to a working position in response to manual operation;

a supply gear coaxially coupled to a spindle adapted for coupling with a first tape reel;

a takeup gear coaxially coupled to a spindle adapted for coupling with a second tape reel;

a first gear assembly including a first gear driven by a motor, a second gear located in coaxial relationship with said first gear and first slip-frictionally coupling means positioned between said second gear and said first gear;

a second gear assembly including a pair of third and fourth gears, second slip-frictionally coupling means positioned between said third and fourth gears and means operable in response to said playback function bar; wherein, when said playback function bar is moved to the working position, said third and fourth gears are engaged to said first gear and said takeup gear, respectively, for transmitting the rotation of said motor to the takeup gear through said first gear, said third gears, said second slip-frictionally coupling means and said fourth gear;

a third gear assembly operable in response to said fast-forward function bar; wherein, when said fast-forward function bar is moved to the working position, said second gear is engaged to said takeup gear for transmitting the rotation of said motor to the takeup gear through said first gear, said first slip-frictionally coupling means and said second gear; and

a fourth gear assembly operable in response to said rewind function bar; wherein, when said rewind function bar is moved to the working position, said second gear is engaged to said supply gear for transmitting the rotation of the motor to the supply gear through said first gear, said first slip-frictionally coupling means and said second gear.

4,680,660

GUIDE GROOVE FOR A GUARD PANEL ON A MAGNETIC TAPE CASSETTE

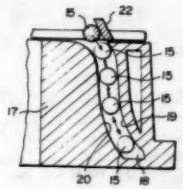
Masaki Ueda, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 3, 1986, Ser. No. 815,950

Claims priority, application Japan, Jan. 7, 1985, 60-364[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **1 Claim**



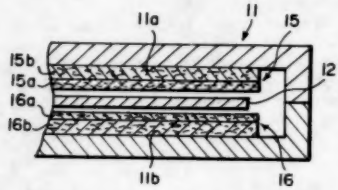
1. A magnetic tape cassette comprising upper and lower case halves for housing a magnetic tape therein, and a guard panel swingably supported to cover the magnetic tape exposed at an aperture section formed at the front race of the case constituted by the upper and lower case halves, wherein said guard panel comprises an outer cover for covering the outer surface of said magnetic tape, said outer cover of said guard panel is approximately U-shaped and constituted by a front wall for covering the outer surface of said magnetic tape, and a pair of side walls extending normal to said front wall and rearwardly of ends of said front wall, and an inner cover having a guide boss on each of two side wall surfaces and supported on said outer cover for movement in synchronization with opening and closing of said outer cover to cover the inner surface of said magnetic tape when said outer cover is closed, said inner cover is approximately T-shaped and constituted by an upper wall for covering an upper side of said aperture section, and a leg wall for covering the inner surface of said magnetic tape, and said guide boss is projected from each of two side wall surfaces of said leg wall, said lower half is provided with an inner cover open/close guide groove formed for slide engagement with said guide boss and extending approximately vertically at each of inner wall sections of tape pull-out holes formed at opposite ends of said aperture section, and said upper half is provided with an auxillary guide rib formed as a guide wall extending upwardly from an upper end of a front side edge of said open/close guide groove when said upper half is combined with said lower half to constitute said case, wherein said auxillary guide rib of said upper half is adapted to contact and hold said guide boss of said inner cover of said guide panel, and then guide said guide boss into said inner cover open/close guide groove of said lower half during assembly of said magnetic tape cassette.

4,680,661

MAGNETIC DISK CARTRIDGE

Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 26, 1985, Ser. No. 813,762
Claims priority, application Japan, Jan. 7, 1985, 60-726
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 5 Claims



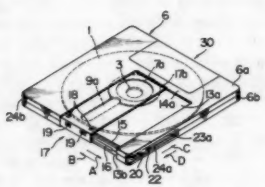
1. A magnetic disk cartridge having a case, a flexible magnetic disk sheet rotatably housed in the case, and at least one liner secured to an inner wall surface of the case facing the magnetic disk sheet so that the liner contacts the magnetic disk sheet, wherein said liner is constituted by two superimposed layers, one of the layers being a nonwoven fabric layer for contact with said magnetic disk sheet, and the other layer being a chemical dust attraction layer secured to the inner wall surface of said case.

4,680,662

DISK CARTRIDGE HAVING A SHUTTER MECHANISM

Yasuhisa Fukushima, Hirakata; Masuo Maruyama, Moriguchi, and Benichi Miyazaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1985, Ser. No. 737,495
Claims priority, application Japan, Jun. 12, 1984, 59-121142; Jul. 5, 1984, 59-101814[U]; Jul. 11, 1984, 59-104879[U]; Apr. 11, 1985, 60-76937
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 7 Claims



1. A cartridge comprising:

a cartridge box including a receptacle for rotatably accommodating a disk, a central hole adapted to receive a rotating means for the rotation of said disk and a head slit adapted to receive a head for recording, reproducing or erasing information on said disk;

a shutter which is movable along guide grooves formed on the outer surfaces of said cartridge box for opening and closing said central hole and said head slit;

a slider for moving said shutter to open or close said central hole and said head slit;

guide groove means for movably guiding said slider; and

an elastic member for resiliently biasing said shutter in a direction of normally closing said central hole and said head slit;

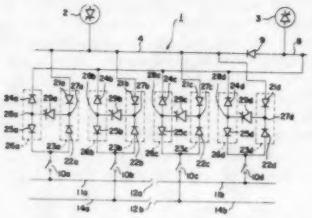
said receptacle having an inner wall which is concentrical with said central hole and is cylindrical-shaped to completely surround the entire periphery of said disk, thereby preventing said disk from being exposed to the outside except through said central hole and said head slit, and said shutter normally closing said central hole and said head slit to shut said disk in said receptacle.

4,680,663

POWER SUPPLY INSTALLATION FOR DC ELECTRIC RAILROAD

Teiji Nogi, Tokyo, and Toyomi Gondo, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,505
Claims priority, application Japan, Jun. 17, 1985, 60-131466
Int. Cl.[4] H02M *7/00*
U.S. Cl. 361—2 5 Claims



1. A power supply installation in a direct current railroad supplying a direct current power to an at least one first electric car power supply line, which comprises:

(a) a power rectifier for converting an alternating current power to a direct current power in powering operation;

(b) a power inverter for converting a direct current power to an alternating current power in regenerative operation;

(c) a stopper diode connected between an output side of said power rectifier and an input side of said power inverter;

(d) a first pair of diodes each having a cathode connected to each other, said first pair of diodes being connected between the output side of said power rectifier and the at least one electric car power supply line;

(e) a second pair of diodes each having a anode connected to each other, said second pair of diodes being connected between the input side of said power inverter and the at least electric car power supply line; and

(f) a breaker connected between a first common junction point of the cathodes of said first pair of diodes and a second common junction point of the anodes of said second pair of diodes, for simultaneously controlling a connection or a disconnection of a powering current supplied from said power rectifier to the electric car power supply line and a regenerative current supplied from the electric car power supply line to said power inverter.

4,680,664

OVERCURRENT PROTECTION CIRCUIT FOR POWER TRANSISTORS

John M. Leuthen, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 9, 1985, Ser. No. 806,873
Int. Cl.[4] H02H *3/04*
U.S. Cl. 361—91 3 Claims

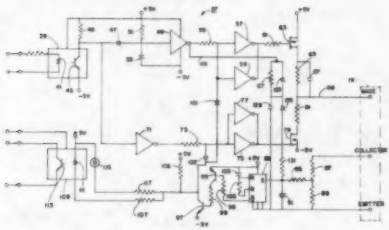
1. A protection circuit for a power transistor of the type having its collector and emitter connected to positive and negative DC rail lines, and having a base that when supplied with positive current, causes the power transistor to conduct, and when supplied with negative current, causes the power transistor to cut off, the circuit comprising in combination:

positive and negative control transistors, one having an input connected to a positive voltage source, and the other having an input connected to a negative voltage source, each control transistor having an output being connected to the base of the power transistor for providing positive

current while the positive control transistor is on, and negative current while the negative control transistor is on;

control means for supplying energizing signals to the control transistors to turn on the positive control transistor and off the negative control transistor, and deenergizing signals to the control transistors to turn off the positive control transistor and on the negative control transistor;

latch means comprising a bistable multivibrator having an input connected to the power transistor for monitoring the voltage across the collector and emitter, and if the voltage exceeds a selected level while the power transistor is on, providing a disabling output;



disabling means connected to the multivibrator and to the control means for turning off the positive control transistor and for turning on the negative control transistor when the disabling means receives a disabling output from the multivibrator; and

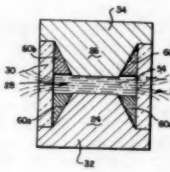
clamp means for holding the input of the multivibrator to a low value below the threshold level while the control means is supplying a deenergizing signal to the control transistors, to prevent triggering of the multivibrator while the power transistor is off, the clamp means including a clamp line extending from the control means to the input of the multivibrator, and including blocking means in the clamp line for blocking the energizing signals from the input of the multivibrator to hold the input of the multivibrator to the low value.

4,680,665

GAS DISCHARGE ARRESTER

John S. Bonnesen, Northbrook, and Timothy J. Sporer, Bensenville, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 3, 1985, Ser. No. 804,056
Int. Cl.[4] H02H *9/06*
U.S. Cl. 361—120 **4 Claims**



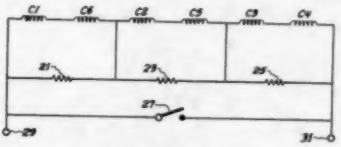
3. In a surge voltage arrester of the type having a gas-tight housing wherein a pair of discharge electrodes are arranged with their active electrode surfaces facing each other and spaced apart in a tubular insulating body, the improvement comprising: two axially spaced annular conductor bands attached to the inner surface of said body, said bands being of a predetermined type of conductive material, said bands covering the inner circumference of said body, one of said bands being in electrical contact with one of said electrodes and the other of said bands being in electrical contact with the other of said electrodes, said conductor bands being the only conductive material of said predetermined type on said inner surface of said body.

4,680,666

MR MAGNET WIRING HARNESS CIRCUIT

Pedro A. Rios, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,552
Int. Cl.[4] H01H *47/00*
U.S. Cl. 361—141 **2 Claims**



1. A wiring harness circuit for a shielded superconducting magnetic resonance magnet comprising:

a plurality of coils of superconductor wire connected in series with one another, said coils symmetrically arranged about a plane of symmetry; and

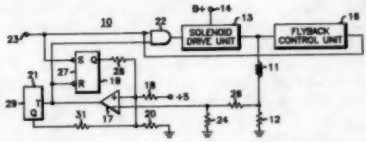
a plurality of resistors, each said resistor connected in parallel with a symmetric pair of coils so that a quench in any one coil results in the same current flow in the coil symmetric thereto.

4,680,667

SOLENOID DRIVER CONTROL UNIT

Adelore F. Petrie, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 778,997
Int. Cl.[4] F02D *41/30*; H01H *47/32*
U.S. Cl. 361—154 **16 Claims**



1. In a solenoid driver control circuit having a control signal input for receiving a control signal, current sense means for providing a current sense signal indicative of current flowing through a solenoid, solenoid drive means for selectively allowing current to flow through said solenoid from a power source, and threshold comparator means for comparing at least one threshold signal with said current sense signal and for providing an output signal in response thereto to control said solenoid drive means, an improvement comprising:

(a) minimum threshold means for providing a minimum threshold to said threshold comparator means;

(b) maximum threshold means for initially providing a maximum threshold to said threshold comparator means at the initiation of said control signal, said maximum threshold means being responsive to said threshold comparator means to only provide said maximum threshold to said threshold comparator means until said current through said solenoid at least equals a preselected peak current; and

(c) timing means responsive to said threshold comparator means for causing said threshold comparator means to provide said output signal to said solenoid drive means for a specified period of time subsequent to said current

through said solenoid at least equalling said preselected peak current, such that current will flow through said solenoid from said power source during said specified period of time.

4,680,668

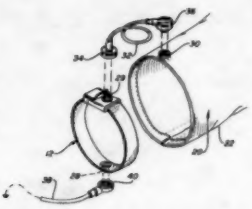
ANTI-STATIC DEVICE

Nathan L. Belkin, Clearwater, Fla., assignor to Superior Surgical Mfg. Co., Inc., Seminole, Fla.

Filed Dec. 28, 1984, Ser. No. 687,381

Int. Cl.[4] A61N *1/14*

U.S. Cl. 361—220 **6 Claims**



1. A device for dissipating electro-static electricity from a person wearing a static protective garment comprising:

a means for continuously conducting electricity between the garment and the person including a conductive wristlet to be worn by the person having means for conducting electricity between the wristlet and a sleeve of the garment, a conductive fastener on said wristlet, a conductive fastener on said sleeve which conductively mates with said conductive fastener on said wristlet, and

a means for continuously conducting electricity from the garment or person to a ground.

4,680,669

CORONA DISCHARGING APPARATUS

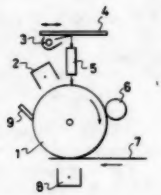
Hiroaki Tsuchiya; Kazuki Tanaka, both of Yokohama, and Keishi Osawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,341

Claims priority, application Japan, Jan. 25, 1983, 58-10244; Jan. 25, 1983, 58-10245; Jan. 25, 1983, 58-10246

Int. Cl.[4] H01T *23/00*

U.S. Cl. 361—230 **13 Claims**



1. A corona discharging apparatus comprising:

a corona discharge electrode;

shield means surrounding said corona discharge electrode, said shield means including an opening for permitting at least corona discharge current to pass therethrough;

support means for supporting said corona discharge electrode;

supersonic vibrator means for vibrating said corona discharge electrode to remove foreign matter from said corona discharge electrode; and

drive means for applying a drive voltage to said supersonic vibrator means, a constant-current source of high voltage for applying a high voltage to said corona discharge electrode, and comparator means for comparing a voltage applied to said corona discharge electrode with a predetermined range of voltage, said drive means being adapted to operate if the voltage applied to said corona discharge electrode is out of said predetermined range of voltage.

4,680,670

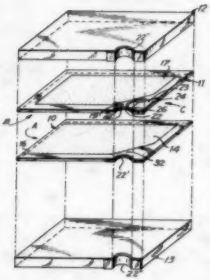
FAIL SAFE CERAMIC CAPACITOR

Ning-Huat Chan, Myrtle Beach, S.C., assignor to AVX Corporation, Great Neck, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,255

Int. Cl.[4] H01G *1/11, 4/10*

U.S. Cl. 361—275 **3 Claims**



1. A fail safe monolithic ceramic capacitor comprising a plurality of superposed layers of dielectric ceramic material, conductive layers of electrode material interposed between such dielectric layers, alternate said conductive layers extending to a first face of said capacitor, first termination means formed on said first face of said capacitor and electrically connecting said alternate layers, the layers intermediate said alternate layers including a reduced cross section area defining a fuse as well as a discrete conductive tab portion extending to a third face of said capacitor spaced from said first face, said tab portion and reduced cross section area of said intermediate conductive layer having portions exiting at proximately spaced positions at a second face of said capacitor, a band of low melt metal in electrical bridging relation of the respective exiting portions of said tab portion and reduced cross section areas of said intermediate conductive layers, and second termination means on said third face of said capacitor linking said tab portions of said intermediate conductive layers.

4,680,671

HIGH VOLTAGE AND HIGH ENERGY STORAGE DEVICE AND A PULSE GENERATOR INCLUDING THE APPLICATION THEREOF

Jean-Claude A. Brion, Ormoy la Riviere; Claude Brunaud, Ver sur Mer; Robert P. H. Jean, Gregy sur Yerres, and René H. Machet, Jouy le Moutier, all of France, assignors to Societe de Verrerie et de Thermometrie, Paris, France

Filed May 1, 1985, Ser. No. 729,411

Claims priority, application France, May 2, 1984, 84 06814

Int. Cl.[4] H01G *4/38;* H05B *37/00*

U.S. Cl. 361—329 **16 Claims**

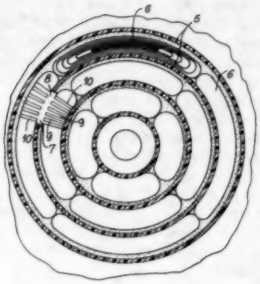
1. A high voltage and high energy storage device for storing energy, said storage device comprising:

an annular assembly surrounding a central core of hard insulating material having an axial central bore extending therethrough,

said assembly comprising a plurality of concentric ring structures having first and second sides, each of said plurality of ring structures being respectively disposed

around an insulating separating element for electrically insulating the respective said ring structure disposed therearound from a concentrically adjacent said ring structure,

each of said ring structures comprising a plurality of flat energy storage elements disposed side-by-side in a cylindrical arrangement around said respective insulating separating element, each of said energy storage elements comprising wound electrically conductive bands covered by a film of dielectric material;



connecting means for electrically connecting said first sides of respective ones of said ring structures to a said ring structure that is disposed concentrically adjacent and inward toward said core from said respective ones of said ring structures and for connecting said second sides of respective ones of said ring structures to a said ring structure that is disposed concentrically adjacent and outward from said core from said respective ones of said ring structures; and

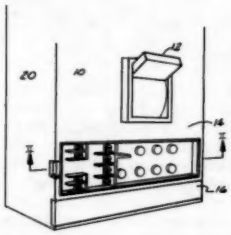
a coating of semi-flexible material covering said assembly.

4,680,672

MOLDED CASE CIRCUIT BREAKER WITH FRONT ACCESSIBLE CONTROL PANEL

William E. May, Lawrenceville; Rex McColloch, Jr., Snellville, and William A. King, Lithonia, all of Ga., assignors to Siemens-Allis, Atlanta, Ga.

Filed Nov. 8, 1985, Ser. No. 796,542
Int. Cl.⁴ H02B 1/04
U.S. Cl. 361—353 **11 Claims**



1. A molded case circuit breaker, comprising:

a molded case having a front, a front portion defining an opening, first and second grooves adjacent opposed boundaries of the front portion opening and a side portion with an opening adjacent the front portion opening;

a circuit board positioned in said first and second grooves on the interior of the molded case; and

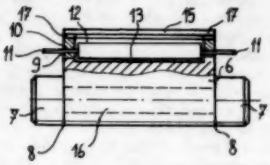
a terminal mounted on the circuit board and accessible from the front.

4,680,673

ENCAPSULATED HOUSING FOR DISSIPATING HEAT PRODUCED BY ELECTRICAL CIRCUITS

Jean C. Taverdet, Orange, France, assignor to Societe Xeram, Courbevoie, France

Filed May 8, 1985, Ser. No. 731,948
Claims priority, application France, May 11, 1984, 84 07297
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—385 **17 Claims**



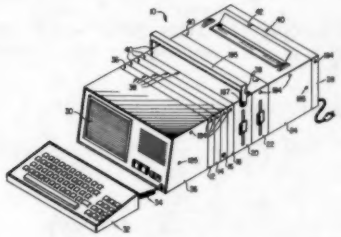
1. Housing for the dissipation of heat produced by electrical circuits, comprising a metallic armature provided in its upper portion with a recess, the bottom of said recess being intended for the attachment of the electrical circuits, and lateral walls of said recess support connections through the intermediary of insulating seals, a cover being disposed at the surface of said recess in such a way as to render it hermetically sealed, and said armature having in a lower portion cooling means for the circulation of at least one cooling fluid, said cooling means comprising a metallic single-piece assembly having lateral walls and separating channels which are arranged in parallel directions and are regularly spaced apart, and said channels having openings formed between the ends of certain of said channels, in such a way as to obtain a circulation network, and two metallic elements disposed on lateral walls of said single-piece assembly so as to seal off the ends of the channels and the openings, the cooling means comprising at least two openings as an inlet and an outlet of the cooling fluid.

4,680,674

MODULAR COMPUTER SYSTEM WITH INTEGRAL ELECTRONIC BUS

Fergus E. Moore, 4801 Hidden Oaks La., Arlington, Tex. 76017

Filed Jul. 16, 1984, Ser. No. 631,251
Int. Cl.⁴ H05K 1/12
U.S. Cl. 361—395 **16 Claims**



1. A modular computer system, including one or more component modules, each comprising:

a casing, including substantially parallel front and rear surfaces, said surfaces having a predetermined dimension;

a computer component contained by said casing;

an array of surface-mount printed circuit board connectors extending outwardly from said front surface of said casing at a predetermined location, each connector incorporating a conductor having an end portion forming a leaf spring

contact for abutting and establishing electrical connection with a surface contact of an adjacent module;

a receptacle extending into said casing from said rear surface, wherein interior dimensions of said receptacle substantially correspond to exterior dimensions of said array of connectors and said connectors are aligned with said receptacle;

an array of surface contacts mounted within the receptacle for abutting and establishing electrical connection with the leaf spring contacts of the connectors of an adjacent module;

a predetermined number of the contacts of the connectors and the receptacle being electrically connected to said component within said casing;

each of said connector contacts is electrically connected to a corresponding contact of said receptacle for transmitting a predetermined signal between said connector and receptacle, said corresponding contacts being aligned on said connector and receptacle such that two or more of said component modules may be stacked with said front end rear surfaces of adjacent modules abutting and with contacts of the connectors and receptacles of adjacent component modules abutting, thereby allowing formation of an electrical bus between adjacent modules with minimal frictional resistance; and

further comprising an input/output module including:

a casing including a rear surface having dimensions substantially equilvalent ot the predetermined dimensions of said front and rear surfaces of said component module casing;

a keyboard interface contained by said input/output module casing;

a visual display contained by said input/output module casing;

an input/output receptacle extending into said input/output module casing from the rear surface thereof at a location corresponding to the location of said receptacle of said component module, wherein the interior dimensions of said input/output module receptacle are substantially equivalent to the exterior dimensions of said array of component module connectors; and

said receptacle of said input/input module includes an array of surface contacts, a predetermined number of which are electrically connected to said display and keyboard interface within said input/output module casing, wherein each of said contacts of said input/output module is disposed in a predetermined location within said input/output module receptacle and interconnected with a corresponding contact of said component module connector.

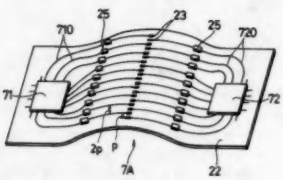
means for mechanically securing together adjacent front and rear surfaces of two or more component modules.

4,680,675

PRINTED CIRCUIT BOARD TERMINAL DEVICE

Hideo Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,814
Claims priority, application Japan, Apr. 25, 1984, 59-83332
Int. Cl.[4] H05K *7/06*
U.S. Cl. 361—397 **1 Claim**



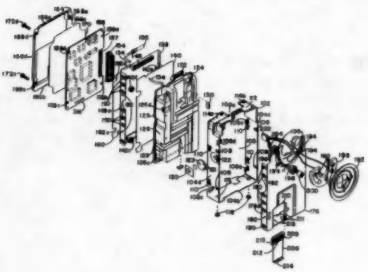
1. A planar printed circuit board of flexible material upon which a first driver and a second driver are mounted and at least one lead terminal section is formed with terminal patterns which extend in a planar line and are closely spaced and have a pitch "p", a first plurality of planar signal output lines formed on one side of said one lead terminal section and extending parallel to each other with pitch of "2p" and connected to a first group of alternate ones of said terminal patterns on said one lead terminal section and connected to said first driver and said first signal output lines and said first group of alternate ones of said terminal patterns lying in a first plane, and a second plurality of planar signal output lines formed on a second side of said one lead terminal section and extending parallel to each other with a pitch of "2p" and connected to a second group of planar alternate ones of said terminal patterns on said one lead terminal section and connected to said second driver and said second signal output lines and said second group of terminal patterns lying in a second plane, wherein a first portion of said printed circuit board upon which said first driver is mounted can be bent so as to lie in a different plane from said lead terminal section, wherein a second portion of said printed circuit board upon which said second drive is mounted can be bent so as to lie in a different plane from said lead terminal section, with a first plurality of resistors mounted on said printed circuit board in series with said first plurality of signal output lines, and a second plurality of resistors mounted on said printed circuit board in series with said second plurality of signal output lines.

4,680,676

PORTABLE RADIO HOUSING WITH LOGIC AND RF SHIELDING

Nickie A. Petratos, Sunrise; David Karl, Tamarac, and William M. Bradford, Fort Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1986, Ser. No. 816,521
Int. Cl.[4] H05K *7/06*
U.S. Cl. 361—424 **14 Claims**



1. A housing for electromagnetically shielding electronic circuits, said housing comprising in combination:

a conductive frame having a multiplicity of sides surrounding a central opening;

a first circuit substrate having front and rear surfaces, said first substrate being positioned in said opening of said frame;

a first electromagnetic shield positioned over said rear surface of said first substrate, said first shield having front and rear surfaces and a plurality of sides substantially perpendicular to said surfaces, certain of said sides of said first shield having spring fingers contacting said frame, said first shield having an opening;

a second circuit substrate having front and rear surfaces positioned over said rear surface of said first shield;

an electrical interconnection between said first and second circuit substrates, said interconnection including first and second mating connectors respectively electrically connected to said first and second substrates, said electrical

interconnection passing through said opening in said first shield; and

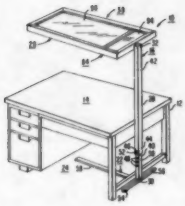
a second electromagnetic shield positioned over said rear surface of said second circuit substrate.

4,680,677

FREESTANDING LUMINAIRE HAVING FLOOR-SUPPORTED FRAME INTEGRATED WITH LIGHT FIXTURE

John J. Ross, 328 D. Babcock Blvd., Gibsonia, Pa. 15044

Filed Mar. 18, 1985, Ser. No. 713,221
Int. Cl.[4] F21V *13/00*
U.S. Cl. 362—33 **13 Claims**



1. A freestanding luminaire, comprising:

(a) a floor-supported frame including an overhead beam arrangement supported in a cantilevered fashion;

(b) lighting means including at least one lamp mounted to said beam arrangement; and

(c) a light enclosure attached to said overhead beam arrangement and surrounding said beam arrangement and said lamp mounted to said beam arrangement so as to define a light fixture which directs the light produced by said lamp upwardly and downwardly therefrom;

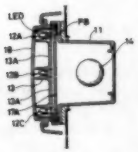
(d) said overhead beam arrangement including a central longitudinally extending beam, and a plurality of cross beams attached to said central beam at spaced locations therealong so as to extend in transverse relationship to the longitudinal extent of said central beam and to support said at least one lamp therebetween.

4,680,678

LIGHTING FIXTURE FOR VEHICLE

Akihiro Iwaki, Ichihara, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 888,154
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—61 **15 Claims**



1. A lighting fixture for a vehicle, comprising:

a housing;

a plurality of light source units each including a plurality of light emitting diodes, said light source units emitting light of at least one color and said light source units being arranged relative to each other at predetermined spaced relations within said housing;

at least one incandescent light bulb in said housing mounted rearwardly of said plurality of light source units; and

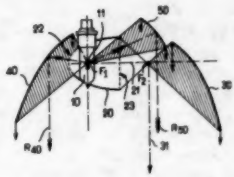
light transmitting means in spaces between said light source units and arranged forwardly of said at least one incandescent light bulb so as to be illuminated by said at least one incandescent light bulb, said light transmitting means, when illuminated by said at least one incandescent light bulb, producing at least one different color light than that produced by said light source units.

4,680,679

MOTOR VEHICLE MAIN BEAM HEADLAMP INCORPORATING AN ELLIPTICAL REFLECTOR AND A PARABOLIC REFLECTOR

Gilbert Dilouya, Paris, France, assignor to Cibie Projecteurs, France

Filed Apr. 17, 1986, Ser. No. 853,060
Claims priority, application France, Apr. 22, 1985, 85 06050
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 **8 Claims**



1. A headlamp of the type comprising:

a light source;

a two-focus elliptical reflector having a base, a base focus and a front focus, said base and said base focus being disposed in the vicinity of said light source and close to the base of the reflector, and said front focus being disposed in front of said base focus; and

a parabolic reflector adapted to reflect light from said front focus in a direction substantially along a veicle axis and having its focus in the vicinity of said front focus of said elliptical reflector;

wherein the base of the elliptical reflector is provided with an opening for directly passing light from said light source, and wherein a first sector of a parabolic type reflector is provided with its focus in the vicinity of said light source and is disposed to reflect such light after passing through said opening along the vehicle axis direction to increase the on-axis main beam light intensity.

4,680,680

COMBINATION VEHICLE LAMP DEVICE

Akihiro Iwaki, Ichihara, and Masayoshi Tajima, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 871,074
Claims priority, application Japan, Jun. 14, 1985, 60-89909
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—80 **19 Claims**

1. A combination-type vehicle lamp device for motor vehicles, comprising:

a single housing;

an outer lens mounted on said housing;

said housing being divided into plural chambers for effecting plural light indications, said chambers including a central chamber located at a central portion of said housing and two side chambers;

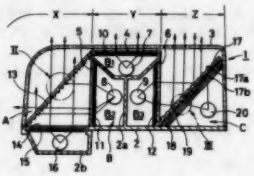
a generally Y-shaped wall in said central chamber for divid-

ing said central chamber into a plurality of small chambers, said small chambers including a first forward-facing small chamber facing said outer lens and two side-facing small chambers facing in opposite directions toward respective side chambers of said housing;

at least one respective lamp being disposed in each of said small chambers;

red color lenses arranged to color red the light emitted by each of said respective lamps in said small chambers of said central chamber;

first and second inclined lenses respectively arranged in said side chambers of said housing for reflecting or refracting light emitted from respective ones of said plural lamps in said side-facing small chambers of said central chamber in



the forward direction of said outer lenses, each of said inclined lenses being disposed inclined to an optical axis in each of said side chambers of said housing;

a first lamp disposed at the back side of one of said inclined lenses with an amber-color lens therebetween, said first lamp being in the side chamber in which its associated inclined lens is arranged;

a second lamp disposed at the back side of the other of said inclined lenses with a clear lens therebetween, said second lamp being in the side chamber in which its associated inclined lens is arranged;

light emitted from each of said first and second lamps being emitted in the forward direction toward said outer lens through each of said respective inclined lenses.

4,680,681

INTEGRAL BOOK COVER AND READING LIGHT

Carl Fisherman, Franklin Lakes, N.J., and Eric Beare, Kowloon, Hong Kong, assignors to Photo Audio Consumer Electronics Marketing Corporation, New York, N.Y.

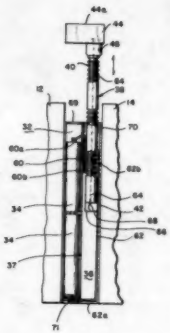
Filed Jul. 7, 1986, Ser. No. 882,725
Int. Cl.[4] A47B *19/00*
U.S. Cl. 362—98 **10 Claims**

1. A book cover and reading light comprising;

a book cover having a central spine section, and two outer covers each pivotally connected to opposite edges of said central spine section;

an elongated housing mounted on said central spine section and including a first compartment for receiving batteries and a second compartment for receiving a supporting arm for a reading light;

said supporting arm being disposed for movement relative to said second compartment between an open position in which said supporting arm extends out of said second compartment and a closed position in which said supporting arm is disposed within said second compartment; and



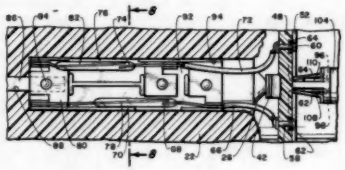
said reading light being movably mounted relative to said supporting arm for directing light in different directions.

4,680,682

WATERPROOF FLASHLIGHT

David H. Parker, 2255 Jefferson St., Torrance, Calif. 90501

Filed Sep. 8, 1986, Ser. No. 904,699
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—158 **3 Claims**



1. A waterproof flashlight comprising:

a tubular barrel having an internal chamber, said internal chamber being adapted to receive a battery;

a light bulb mounted on said tubular barrel, said light bulb extending at least partially within said internal chamber, said light bulb being adapted to electrically connect with the battery, said light bulb having a high beam and a low beam;

a lens housing mounted on said tubular barrel enclosing said light bulb;

waterproof sealing means mounted between said lens housing and said tubular barrel for preventing entry of water

into said internal chamber, said waterproof sealing means comprising at least one elastomeric O-ring seal;

a switch assembly mounted on said tubular barrel, said switch assembly being movable between an off position and a low beam position and a high beam position; and

said switch assembly including a magnet mounted exteriorly of said tubular barrel and a magnetically operable switch assembly mounted within said internal chamber of said tubular barrel, said magnetically operable switch assembly being operable by said magnet with the electromagnetic force of said magnet being conducted through the wall of said tubular barrel.

4,680,683

BATTERY AND BULB CONVERSION CARTRIDGE FOR SELF-FEEDING CANDLE HOLDER

Robert W. Schenke, P.O. Box 271, and Reynold A. Schenke, P.O. Box 59, both of Paradise, Pa. 17562

Filed Jun. 2, 1986, Ser. No. 869,324
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—190 **3 Claims**

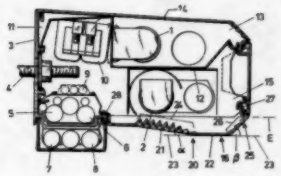
1. In combination with a simulated candle including a one-piece upstanding outer tubular member for receiving a consumable candle and having a tapered upper end defining a reduced diameter upper end axial opening with whose periphery the upper end outer periphery of a consumable candle may abut, an electrically conductive inner tube removably telescopingly received within said outer tubular member through the lower end thereof to a position spaced immediately below and abutted against the inner surfaces of said outer tubular member disposed below and about said opening, the upper end of said inner tube defining bulb base receiving socket means including relatively electrically insulated wall and center contact means constructed of electrically conductive material, a storage battery slidingly disposed in said inner tube and including an upper contact for electrical contact with said center contact means and an outer contact defining case relative to which said upper contact is insulated, a removable plug closing the lower end of said outer tubular member, electrically conductive compression spring means disposed within said outer tubular member above and contacting said plug and projecting upwardly into the lower end of said inner tube for engagement, while under compression, with said battery, the lower end of said spring being electrically connected to said outer tubular member, the lower end of said inner tube being frictionally electrically connected with said outer tubular member, said socket wall contact means being electrically connected to said inner tube, said inner tube being constructed of electrically conductive material and the upper end of said inner tube being abutted against and in electrical contact with the inner surfaces of said outer tubular merber disposed below and about said opening, said inner tube and spring, upon removal of said plug, being removable from the lower end of said outer tubular member, the lower end of said inner tube including outwardly flared portions by which said innter tube is frictionally electrically and slidably frictionally engaged with the opposing inner surfades of said outer tubular member, the upper end of said inner tube comprising a diametrically reduced portion of said inner tube, said battery being received within said inner tube below said upper end thereof, said spring exerting an upward thrust on said battery with the upper end of the outer contact defining case of said battery electrically contacting the inner surfaces of the diametrically reduced portion of said inner tube.

4,680,684

BED READING LAMP, PARTICULARLY FOR HOSPITAL BEDS

Wolfgang Wolber, Götzis, Austria, assignor to Zumtobel Aktiengesellschaft, Austria

Filed Oct. 24, 1985, Ser. No. 790,746
Claims priority, application Austria, Oct. 31, 1984, 3468/84
Int. Cl.[4] F21V *5/02*
U.S. Cl. 362—223 **7 Claims**



1. Bed reading lamp, particularly for hospital rooms, comprising a lamp housing, which is preferably attachable to a wall of a room comprising at least one tubular, elongate lamp and a reflector and at least one cover which closes a light outlet opening provided in the lower area of said housing and which is translucent and serves to guide the light and comprises a lower first portion and a front upright second portion connected to the latter, characterized in that said first portion **(20)** of said cover **(16)** located under said lamp **(2)** has a horizontal part **(22)** and a part **(21)** which is inclined downwardly toward said horizontal part **(22)**at an angle α of approximately 6° to 10° relative to said horizontal part **(22)** said inclined part **(21)** having a prismatic profile **(24)** parallel to the axis of said lamp **(2)** on its side facing said lamp **(2)** and said second portion **(25)** comprises a prismatic profile **(26)** at its inside and encloses an angle β of approximately 40°–50° relative to said horizontal part **(22)**, wherein the height (H) of said prismatic profiles **(24)** of said inclined part **(21)** decreases and said aperture angle increases toward the horizontal part **(22)** of said first portion **(20)**.

4,680,685

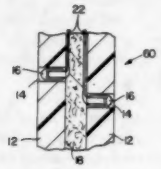
LIGHT PANEL

Peter Altman, Philadelphia, Pa., assignor to Light and Sound Specialties, Inc., Philadelphia, Pa.

Filed Aug. 5, 1986, Ser. No. 893,503
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—240 **12 Claims**

1. A light panel device comprising:

a thermoplastic translucent body having at least one hole therethrough and an exposed and an unexposed surface;



a lamp placed within each hole so as not to project beyond the exposed surface; and

a fiberglass backing layer secured to the unexposed surface.

4,680,686

ELECTRIC 3-PHASE SUPPLY DEVICE FOR AN OZONIZER

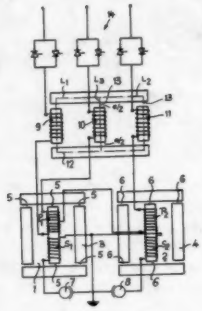
Paul Chapsal, and Jean-Francois Petitimbert, both of Garges-les-Gonesse, France, assignors to Trailigaz "Cie Generale de l'Ozone" , Garges-les-Gonesse, France

Filed Dec. 23, 1985, Ser. No. 812,682

Claims priority, application France, Dec. 28, 1984, 84 20046

Int. Cl.[4] H02M *5/00*

U.S. Cl. 363—10 **5 Claims**



1. A power supply device for connection to a 3-phase mains supply of an ozonizer comprising at least two capacitive discharge elements, said device comprising two single-phase step-up voltage transformers having air gaps connected in a Scott circuit, and connected between the 3-phase mains supply and said discharge elements.

4,680,687

SWITCH-MODE POWER SUPPLY HAVING A FREE-RUNNING FORWARD CONVERTER

Harald Stasch, Neuried, and Rudolf Schierjott, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,146

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429103

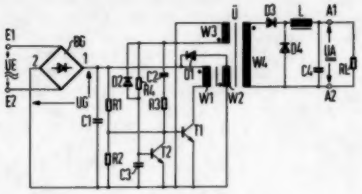
Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—18 **5 Claims**

1. A switch-mode power supply comprising:

a rectifier including an input for receiving a.c. voltage and an output for delivering d.c. voltage; and

a free-running converter including a switching transistor, a transformer connected to said switching transistor, an output circuit, including a free-wheeling diode, connected to said transformer for delivering d.c. voltage, and control means connected to said transformer and to said switching transistor and operable to always switch on said switching



transistor in the currentless state of said free-wheeling diode.

4,680,688

DC/DC CONVERTER

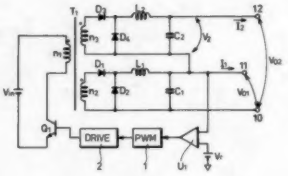
Kiyoharu Inou; Hideaki Matsumura, and Hitoshi Saito, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,661

Claims priority, application Japan, Oct. 23, 1984, 59-222698

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **7 Claims**



1. A DC/DC converter comprising

at least one converter comprising

a transformer having a primary coil and a plurality of secondary coils;

a switching circuit adapted to turn ON and OFF a supply of input DC voltage to said primary coil;

rectifying and smoothing circuits for rectifying and smoothing AC voltages obtained in said secondary coils;

a plurality of output terminals for outputting a plurality of DC output voltages from said rectifying and smoothing circuits;

circuit means for obtaining the sum of output voltages from resspective rectifying and smoothing circuits; and

control means responsive to the lowest DC output voltage from said rectifying and smoothing circuits for controlling the ON-OFF operation of said switching circuit, thereby to maintain said lowest DC output voltage at a constant level; wherein one of said output terminals of the lowest DC output voltage is a common terminal;

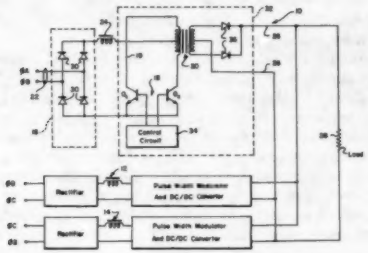
wherein said input DC voltage is obtained by rectifying an AC voltage supplied through a noise filter, and wherein said noise filter comprises common mode chokes connected in parallel with respective power lines, and capacitors connected in parallel with respective common mode chokes and said capacitors having the same capacitance value, said capacitance value being selected so that the resonance frequency of said capacitances in combination with said common mode chokes, falls in a predetermined range.

4,680,689

THREE-PHASE AC TO DC POWER CONVERTER WITH POWER FACTOR CORRECTION

Donald W. Payne, 2450 Transit Ave., Anaheim, Calif. 92804, and Bruce Hemp, La Mirada, Calif., assignors to Donald W. Payne, Anaheim, Calif.

Filed Jan. 23, 1984, Ser. No. 573,086
Int. Cl.[4] H02M 1/12, 7/155
U.S. Cl. 363—26 **2 Claims**



1. A method of converting three-phase AC to DC voltage wherein the power factor is substantially corrected and current harmonics are reduced, comprising the steps of:

(A) individually rectifying each phase of the three-phase AC voltage to form a full wave rectified variable voltage source;

(B) generating a series of spaced apart timing pulses having a frequency substantially greater than the frequency of said AC voltage source;

(C) using said timing pulses to control the flow of DC current from each full wave rectified variable voltgae source to an energy storing inductor such that the flow of DC current to said inductor is linear and is proportional to the instantaneous magnitude of the variable voltage supplied by said voltage source; and,

(D) successively transferring all of the energy stored in said inductor to a load in the time intervals between said timing pulses,

steps (C) and (D) being performed such that the AC to DC voltage conversion results in a substantially resistive load being presented to said AC voltage source.

4,680,690

INVERTER FOR USE WITH SOLAR ARRAYS

Arthur F. Dickerson, 245 Hacienda Ave., San Luis Obispo, Calif. 93401

Continuation-in-part of Ser. No. 662,783, Oct. 19, 1984, Pat. No. 4,591,965. This application May 23, 1986, Ser. No. 866,863
Int. Cl.[4] H02M 1/12
U.S. Cl. 363—43 **2 Claims**

1. A system for generating a six phase alternating current on the lines L_1, L_2 . . . L_6, comprising in combination:

a first high power array having a positive terminal and having a negative terminal denoted by D_1;

a first low power array having a positive terminal and having a negative terminal denoted by D_2, the positive terminals of said first high power array and of said first low power array being connected to a common positive terminal denoted by C^+;

a second high power array having a negative terminal and having a positive terminal denoted by D_1';

a second low power array having a negative terminal and having a positive terminal denoted by D_2', the negative terminals of said second high power array and of said second low power array being connected to a common negative terminal denoted by C^-;

switching means connected to the terminals D_1, D_2, C^+, D_1', D_2', and C^- and connected to the lines L_1, . . . L_6 for generating a first phase A on the line $L_1$by

(a) connecting D_2' to L_1 for an interval of 30° starting at 0° and again at 150°

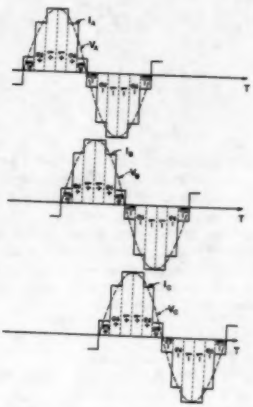
(b) connecting D_1' to L_1 for an interval of 30° starting at 30° and again at 120°

(c) connecting C^+ to L_1 for an interval of 60° starting at 60°

(d) connecting D_2 to L_1 for an interval of 30° starting at 180° and again at 330°

(e) connecting D_1 to L_1 for an interval of 30° starting at 210° and again at 300°

(f) connecting C^- to L_1 for an interval of 60° starting at 240°



for generating a second phase B on the line L_2 by repeating steps (a) through (f) with L_2 substituted for L_1 and with 120° added to all of the starting phases, for generating a third phase C on the line L_3 by repeating steps (a) through (f) with L_3 substituted for L_1 and with 240° added to all of the starting phases, for generating a fourth phase $\overline{A}$ on the line L_4 by repeating steps (a) through (f) with L_4 substituted for L_1 and with 180° added to all of the starting phases, for generating a fifth phase $\overline{B}$ on the line L_5 by repeating steps (a) through (f) with L_5 substituted for L_1 and with 300° added to all of the starting phases, and for generating a sixth phase $\overline{C}$ on the line L_6 by repeating steps (a) through (f) with L_6 substituted for L_1 and with 420° added to all of the starting phases.

4,680,691

METHOD AND SYSTEM FOR PREVENTING AN EXCESSIVE VOLTAGE BUILD-UP IN A POWER CONVERTER SYSTEM

Teruo Yoshino, and Katsuro Itoh, both of Fuchu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1986, Ser. No. 871,365
Claims priority, application Japan, Jun. 10, 1985, 60-124283
Int. Cl.[4] H02H 7/00
U.S. Cl. 363—51 **4 Claims**

1. A method for operating a power converter connected between a DC bus line and an AC bus line, said AC bus line provided with a synchronous condenser and connected to an AC power system through a breaker, comprising the steps of:

detecting whether or not said breaker is opened;

detecting whether or not said synchronous condenser is under operation;

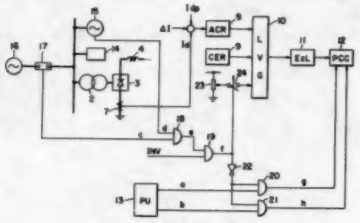
detecting whether or not said power converter works as inverter; and

driving said power converter at a firing angle cancelling a capacitive reactive power of said AC bus line when said

breaker is opened, said synchronous condenser is under operation, and said power converter works as inverter.

3. A system for operating a power converter connected between a DC bus line and an AC bus line, said AC bus line provided with a synchronous condenser and connected to an AC power system through a breaker, comprising:

first means for generating a second signal while said breaker is opened;



second means for generating a second signal while said synchronous condenser is under operation;

third means for generating a third signal while said power converter works as inverter; and

control means for driving said power converter at a predetermined firing angle upon reception of said first, second and third signals thereby consuming on said AC bus line a reactive power sufficient for cancelling a capacitive reactive power of said AC bus line.

4,680,692

CONTROL APPARATUS OF AC/DC POWER CONVERTER

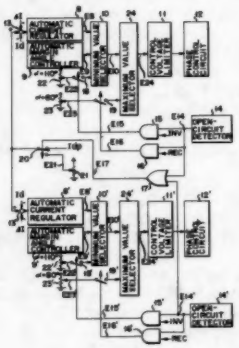
Takami Sakai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1985, Ser. No. 808,047

Claims priority, application Japan, Dec. 28, 1984, 59-276119

Int. Cl.[4] H02J *3/36*

U.S. Cl. 363—35 **14 Claims**



1. A control apparatus of an AC/DC power converter whose power converting operation depends on a control angle and which is coupled to a power line of an AC power system, said AC/DC power converter being provided with an automatic current regulator which provides a current control voltage corresponding to said control angle, comprising:

detector means for detecting an open-circuit of the power line of said AC power system, and generating a detection signal which indicates the open-circuit of said power line;

set means, coupled to said detector means, for setting, in accordance with the generation of said detection signal, said control angle at a predetermined value which is used for controlling the power converting operation of said AC system when said open-circuit occurs, comprising,

first control voltage means for providing a first control voltage corresponding to said predetermined value, and

second control votage means for providing a second control voltage corresponding to said predetermined value;

lock means, coupled to said detector means, for locking, in accordance with the generation of said detection signal, a current set value of said automatic current regulator at a given value when said open circuit occurs;

an automatic margin angle controller which provides a margin angle control voltage;

minimum value selector means, coupled to said automatic margin angle controller, said automatic current regulator and said first control voltage means, for selecting the minimum one of said current control voltage, said margin angle control voltage and said first control voltage, and providing a selected control voltage representing the selected minimum one which is used for controlling the power converting operation of said AC system; and

maximum value selector means, coupled to said minimum value selector means and said second control voltage means, for selecting the maximum one of said selected control voltage and said second control voltage, and providing a selected control signal representing the selected maximum one which is used for controlling the power converting operation of said AC system.

4,680,693

CONTINUOUS HIGH D.C. VOLTAGE SUPPLY PARTICULARLY FOR AN X-RAY EMITTER TUBE

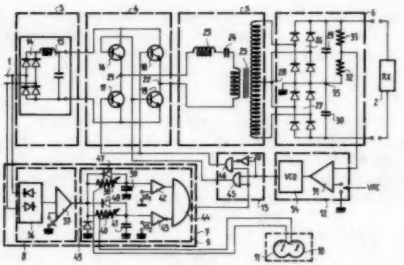
Claude Carron, Montmagny, France, assignor to Thomson-CGR, Paris, France

Filed Feb. 10, 1986, Ser. No. 827,725

Claims priority, application France, Feb. 12, 1985, 85 01971

Int. Cl.[4] H02P *13/20*

U.S. Cl. 363—98 **5 Claims**



1. A high voltage d.c. supply which receives alternating electrical energy from a general single-phase distribution mains, comprising:

means for periodically tapping said energy from said mains during periods having a duration less than a half-wave of the alternating electrical energy to thereby produce periodically chopped high d.c. voltage synchronized with said alternating electrical energy;

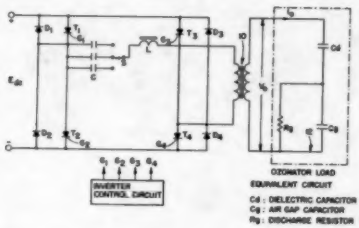
means for regulating said chopped high voltage wherein said regulating means includes a frequency modulator for modulating an oscillating frequency of a ripple generator and wherein said means for periodically tapping said energy includes a means for validating that said regulating means is operating.

4,680,694

OZONATOR POWER SUPPLY

Anh N. Huynh, Edgewood, Ky., and Phoivos D. Ziogas, Brossard, Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,737
Int. Cl.[4] H02M 7/521
U.S. Cl. 363—136 **9 Claims**


INVERTER CONTROL CIRCUIT
OZONATOR LOAD EQUIVALENT CIRCUIT
Cd : DIELECTRIC CAPACITOR
Cg : AIR GAP CAPACITOR
Rg : DISCHARGE RESISTOR

1. A power supply circuit for an ozonator comprising:

a. a DC/AC semiconductor switch bridge inverter coupled at its input terminals of a resonant network, said semiconductor switch bridge inverter comprising a first semiconductor switch means for conducting through the resonant network in a first direction and a second semiconductor switch means for conducting through the resonant network in a second direction;

b. said resonant network having a step up high voltage transformer with its primary winding coupled to said semiconductor switch bridge inverter and its secondary winding coupled to the ozonator; and

c. an inverter control circuit for controlling the gating electrodes of said first and second semiconductor switch means, said inverter control circuit comprising first and second AND gate means for controlling gating of said first and second semiconductor switch means, for generating a switching frequency square wave signal and applying it to a first input of each of said first and second AND gate means, and means for generating a high frequency pulse train and applying it to a second input of each of said first and second AND gate means, such that the first and second AND gate means generate gating signals to cause said first and second semiconductor switch means to operate in a pulse burst modulation mode wherein the switching frequency of the square wave signal controls the timing between pulse bursts, and the number of high frequency pulses within each pulse burst is controlled by the frequency of the high frequency pulse train and the width of each pulse in the square wave signal.

4,680,695

CROSS COUPLED CURRENT REGULATOR

Russel J. Kerkman, and Timothy M. Rowan, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 735,659, May 20, 1985, abandoned.
This application Oct. 27, 1986, Ser. No. 922,775
Int. Cl.[4] H02P 13/30, 5/40
U.S. Cl. 363—160 **5 Claims**

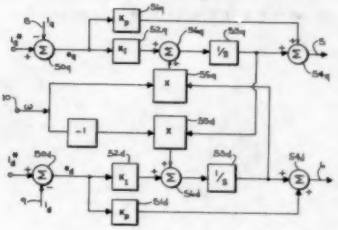
1. In a variable frequency power supply which receives a plurality of sinusoidal current command signals and produces sinusoidal output currents to a load, a polyphase current regulator for receiving the plurality of sinusoidal current command signals and producing composite control signals, each current regulator phase comprising:

first summing means for receiving at one input one of said sinusoidal current command signals and receiving at a second input a sinusoidal current feedback signal indicative of sinusoidal output current supplied to said load, the first summing means being operable to produce an error signal which is indicative of the difference between the sinusoidal current command signal and the sinusoidal current feedback signal;

second summing means for receiving at one input a signal proportional to said error signal and for receiving at a second input a cross coupled signal, the second summing means being operable to produce a summed signal which is proportional to the sum of the signals applied to its two inputs;

an integrator having an input connected to receive the summed signal from the second summing means and being operable to produce an integrator output signal which is the integral of the summed signal applied to its input;

third summing means for receiving at one input the integrator output signal and for receiving at a second input a



signal proportional to said error signal, the third summing means being operable to produce one of the composite control signal which is proportional to the sum of the signals applied to its inputs; and

means for producing said cross coupled signal which includes:

(a) a multiplier having its output connected to the second summing means,

(b) means for coupling to one input on the multiplier a signal which is proportional in magnitude to the frequency of said one sinusoidal current command, and

(c) means for coupling to another input on the multiplier a signal received from another of said current regulator phases.

4,680,696

INK JET RECORDER WITH IMPROVED SYSTEM FOR TRANSPORTING INK TO OR FROM RECORDING HEADS

Ryuichi Ebinuma, Hiratsuka; Yoshifumi Hattori, Yamato, and Hiroo Ichihashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 684,117, Dec. 20, 1984, abandoned.
This application Sep. 29, 1986, Ser. No. 913,613
Claims priority, application Japan, Dec. 26, 1983, 58-244131; Dec. 26, 1983, 58-244132; Dec. 26, 1983, 58-244133; Dec. 26, 1983, 58-244134; Dec. 26, 1983, 58-244135; Dec. 26, 1983, 58-244136; Dec. 26, 1983, 58-244138
Int. Cl.[4] G01D 15/18, 15/16
U.S. Cl. 346—75 **16 Claims**

1. An ink-jet recorder comprising:

a head having a plurality of head elements for discharging ink to record a pattern;

a first tank for storing ink to be supplied to said head elements;

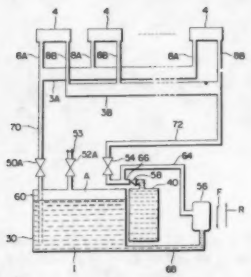
a second tank for storing ink to be supplied to said first tank; and

an ink transport system for transporting the ink among said head elements, said first tank and said second tank;

said ink transport system including:

(a) first distribution means connected to a head port for each said head element;

(b) second distribution means connected to another head port for each said head element;
(c) first transport means arranged between said first tank and said first distribution means to form a first transport path for the ink;
(d) first switching means arranged in said first transport means to selectively block said first transport path;
(e) swcond transport means arranged between said first tank and said second distribution means to form a second transport path for the ink;
(f) second switching means arranged in said second transport means to selectively block said second transport path;
(g) a pump disposed in said second transport means between said first tank and said second switching means and having a first port connecting to said first tank and



a second port connecting to said second switching means, said pump being operable in a first direction to transport the ink from said second port to said first port in a second direction to transport the ink from said port to said second port;
(h) third transport means connected to said second tank and having back-flow prevention means for regulating the flow of ink to only the direction flowing from said second tank, said third transport means transporting the ink from said second tank to said second port; and
(i) third switching means for opening an air chamber in said first tank to atmosphere while ink is flowing through said first or second distribution means to or from said head elements, whereby ink can be transported through said ink transport system without escaping to the atmosphere.

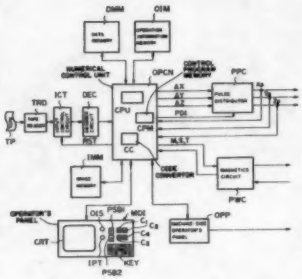
4,680,697

NUMERICAL CONTROL SYSTEM

Nobuyuki Kiya, Hachioji, and Motoaki Yoshino, Suginami, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00032, § 371 Date May 31, 1985, § 102(e) Date May 31, 1985, PCT Pub. No. WO85/03366, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 26, 1985, Ser. No. 739,672
Claims priority, application Japan, Jan. 26, 1984, 59-012428
Int. Cl.[4] G06F *15/46;* G05B *19/18*
U.S. Cl. 364—171 **9 Claims**

1. A numerical control method for a system including a numerical control unit for performing numerical control on the basis of operation information necessary for numerical control and having an operation information memory, and a numerical control operator panel with only numeric and cursor control keys and a display unit, the numerical control method comprising the following steps:
(a) entering, into the numerical control unit, a numeric code of a character of operation information output by using the numeric keys provided on the numerical control operator's panel and converting the code into one or more text characters corresponding to the code;
(b) displaying, by the numerical control unit, on the display unit, the operation information coverted into the one or more text characters by step (a);



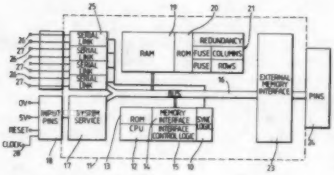
(c) storing, by the numerical control unit, in the operation information memory, the operation information displayed by step (b); and
(d) performing, by the numerical control unit, numerical control processing on the basis of the operation information stored by step (c).

4,680,698

HIGH DENSITY ROM IN SEPARATE ISOLATION WELL ON SINGLE WITH CHIP

Jonathan Edwards, Bristol; David L. Waller, Avon, and Michael D. May, Bristol, all of England, assignors to Inmos Limited, Bristol, England

Filed Nov. 16, 1983, Ser. No. 552,601
Claims priority, application United Kingdom, Nov. 26, 1982, 8233733
Int. Cl.[4] G06F *13/00, 15/16, 7/48;* H01L *27/02*
U.S. Cl. 364—200 **15 Claims**



1. A network of interconnected microcomputers, each microcomputer comprising:
(a) a single integrated circuit chip having a substrate of semiconductor material of a first type,
(b) an on-chip high density RAM array having at least one K byte for holding a program containing instructions for execution by said on-chip processor,
(c) a plurality of communication links each forming an interconnection with an adjacent microcomputer in the network,
(d) an instruction pointer circuit for addressing said RAM to obtain program instructions therefrom,
(e) an instruction receiving circuit coupled to said RAM for receiving said instructions from said program stored in said RAM,
(f) an instruction decoder circuit coupled to said receiving circuit for decoding instructions received by said instruction receiving circuit,

(g) a plurality of on-chip transistors comprising circuitry operable independently of the operation of said RAM,

(h) first isolation well means formed in said substrate of a semiconductor material of different type than said substrate, said first isolation well means containing all of said memory cells of said high density RAM array, and

(i) second isolation well means separate from said first isolation well means and formed in said substrate of a semiconductor material of different type than said substrate, said second isolation well means containing some of said transistors which are operable independently of said operation of said RAM,

whereby each microcomputer in the network operates in accordance with instructions from program in its on-chip RAM and each on-chip RAM is protected from noise due to operation of independently operating transistors.

4,680,699

TERMINAL CONTROL APPARATUS FOR PARALLEL EXECUTION OF DATA EDITING AND DATA TRANSMISSION/RECEPTION CONTROL

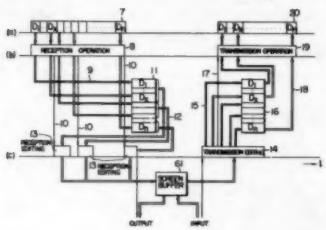
Megumi Uchino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,833

Claims priority, application Japan, May 13, 1983, 58-83627

Int. Cl.[4] G06F *3/02*

U.S. Cl. 364—200 **3 Claims**



1. A terminal control apparatus for controlling data transfer between a terminal device and a central processor comprising:

buffer memory means;

terminal control means connected to said terminal device for controlling transfer of data to and from said terminal device and editing of said data, including first means for editing first data received from said terminal device into a format for transfer to said central processor and for storing the edited first data into said buffer memory means, and second means for reading out from said buffer memory means a predetermined amount of second data to be transferred from said central processor to said terminal device, for editing it into a format suitable for transfer to said terminal device, and for transferring the predetermined amount of the edited second data to said terminal device;

communication control means connected to said central processor for controlling transfer of data to and from said central processor, including third means for reading out from said buffer memory means a predetermined amount of the edited first data which has been stored therein by said terminal control means and for transferring the predetermined amount of the edited first data to said central processor, and fourth means for writing the second data to be transferred from said central processor to said terminal device into said buffer memory means; and

interface control means connected between said terminal control means and said communication control means for controlling said communication control means to read out the predetermined amount of the edited first data from said buffer memory means and transfer it to said central processor each time said terminal control means has written said predetermined amount of the edited first data into said buffer memory means and at the same time said terminal control means is writing a further predetermined amount of edited first data into said buffer memory means, and controlling said terminal control means to read out from said terminal device said predetermined amount of the second data from said buffer memory means and transfer the predetermined amount of the edited second data to said terminal device each time said communication control means has written the predetermined amount of the second data into said buffer memory means and at the same time said communication control means is writing a further predetermined amount of the second data into said buffer memory means.

4,680,700

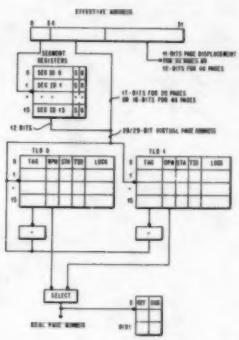
VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH COMBINED HASH ADDRESS TABLE AND INVERTED PAGE TABLE

Phillip D. Hester, and Richard O. Simpson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 558,244, Dec. 7, 1983, abandoned. This application Dec. 19, 1986, Ser. No. 945,228

Int. Cl.[4] G06F *13/00, 9/36*

U.S. Cl. 364—200 **14 Claims**



1. A data processing system comprising:

a central processing unit for accessing information stored in page frames by providing a virtual memory address from a virtual memory address space, said virtual memory address space including a plurality of page frame addresses,

a first memory for storing information organized as a plurality of page frames and accessible by memory addresses represented by a real memory address space and wherein the virtual memory address space includes a substantially larger number of page frames than the real memory address space;

means connected to the central processing unit and the first memory for converting virtual memory addresses received from the central processing unit into real memory addresses for accessing information from single page frames from said first memory, said converting means including:

means for hashing a selected virtual address to produce a hashed address;

a first table having a list of hashed addresses each with a corresponding predetermined initial virtual address and a pointer to an entry in a second table;

said second table having a list of virtual addresses corresponding to the initial virtual addresses in the first table

and further having a location in the second table corresponding directly to a unique page frame in the real memory address space and each virtual address including a corresponding link address, said link address connecting a plurality of noncontiguous virtual addresses that when hashed produce the same hashed address; and

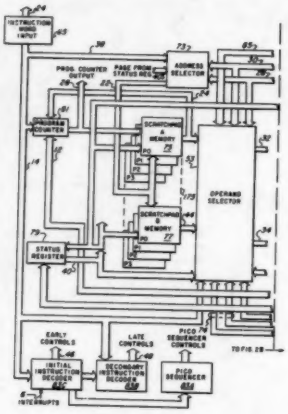
means for receiving an input virtual memory address, hashing said input virtual memory address with said hashing means to produce an input hashed address, selecting a location in said first table in accordance with said input hashed address, searching the corresponding linked addressed locations until the input virtual memory address is located, locating the corresponding input virtual address in the second table and its corresponding real address.

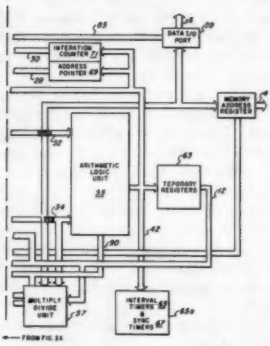
4,680,701

ASYNCHRONOUS HIGH SPEED PROCESSOR HAVING HIGH SPEED MEMORIES WITH DOMINO CIRCUITS CONTAINED THEREIN

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 11, 1984, Ser. No. 598,946
Int. Cl.[4] G06F *15/00*; B01F *15/02*
U.S. Cl. 364—200 **3 Claims**





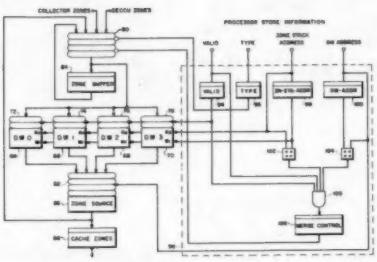
1. An asynchronous high speed processor system comprising: high speed processor means for executing each program instruction in a single fetch cycle; an instruction means for communicating instructions to the high speed processor means; a data memory for communicating data to the high speed processor means; the high speed processor means includes: an arithmetic logic unit (ALU) for performing arithmetic and logic operations upon the data provided by the data memory means under control of instructions from the instruction memory means, said arithmetic logic unit (ALU) requires two operands for operation in a single fetch cycle, the high speed processor means further includes; first memory means connected to said ALU so as to communicate the first operand, and second memory means connected to said ALU so as to communicate the second operand; and means for prefetching an instruction from the instruction memory means for an operation of the arithmetic logic unit upon data provided by the data memory means and wherein the means for prefetching comprises a memory having a plurality of stages for decoding the prefectched instruction and said memory further includes a domino circuit means responsive to a signal from the high speed processor means for providing a plurality of completion pulses indicating the availability of the prefecteched instruction for use by said ALU with each single completion pulse representative of the maximum signal propagation time delay through a predetermined single stage of the memory.

4,680,702

MERGE CONTROL APPARATUS FOR A STORE INTO CACHE OF A DATA PROCESSING SYSTEM

Daniel M. McCarthy, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 27, 1984, Ser. No. 604,769
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **8 Claims**



1. A computer system comprising:

A central processor unit, CPU, having at least one execution unit means for executing instructions and producing processor data words, a store into cache for storing data words, means for issuing store into cache commands, and CPU circuit means interconnecting the execution unit means, the store into cache, and the means for issuing store into cache commands, the receipt of a store into cache command by the cache causing the cache to store at least one zone of data bits from a pair of processor data words produced by the execution unit means, each data word consisting of a predetermined number of bits which number is a multiple of the number of bits in a zone; and

hierarchical memory system means operatively connected to the CPU for storing in and reading out of said memory system means blocks of system data words at locations of the memory system means having addresses, each block of system data words having a block address, a block address being the address of a block of addressable locations of the memory system means;

said execution unit means producing as the result of the execution of an instruction at least one zone of processor data in a pair of processor data words for storage in the store into cache;

means connected to the CPU circuit means for producing zone control bits having a predetermined binary value to

identify the zones of each pair of processor data words containing processor data produced by said execution unit means for storage in the store into cache;

means connected to the CPU circuit means for producing the block address of each pair of processor data words produced by the execution unit means for storage in the store into cache;

said store into cache, in response to the receipt by the cache of a store into cache command, of a pair of processor data words, of a block address of the pair of processor data words, and of the zone control bits for said pair of processor data words, storing in said cache the bits of the zones of the processor data words containing processor data identified by zone control bits having said predetermined binary value said bits of the zones of the processor data words being stored in locations corresponding to the block address of said pair of processor data words;

register means connected to the CPU circuit means for storing the zone control bits produced by the means for producing zone control bits;

means operatively connected to the register means for extracting the zone control bits from the register means upon the receipt of a store to cache command for a block of system data words having the same block address as that of processor data words previously stored in the store into cache, said zone control bits having said predetermined binary value identifying the zones of the data words stored in the cache containing processor data; and

means operatively connected to the means for extracting zone control bits and responsive to the zone control bits having said predetermined binary value for inhibiting the cache from storing corresponding zones of system data words of a block of system data words read out of hierarchical memory system means and transmitted from the hierarchical memory system means to the CPU.

4,680,703

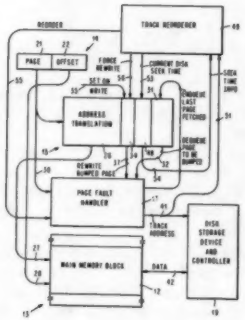
DATA PROCESSING SYSTEM WITH REORGANIZATION OF DISK STORAGE FOR IMPROVED PAGING

Thomas A. Kriz, Sandy Hook, Conn., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,485

Int. Cl.[4] G06F *12/12*; G11B *20/12*

U.S. Cl. 364—200 **1 Claim**



1. In a data processing system having

means for transferring pages of data between tracks of a disk storage device and page locations of a main memory, including means for selecting a track address,

means for bumping a page from main memory when a page location is needed for an addressed page, including means for rewriting a bumped page into the next available tracks as pages are bumped from main memory, and including means for identifying data pages in page locations of main memory and for identifying whether the page in memory has been changed from the page on disk, and means for selectively rewriting a page from memory onto disk only if a change has been made,

apparatus for reordering the pages on the tracks of the disk for reduced track seek time, comprising,

means for maintaining a queue of pages brought into main memory from the disk,

means for measuring track seek time and means for maintaining a list containing the track seek time for each page location, wherein said means for maintaining the seek time list comprises

storage means for holding the seek time for each page location,

means providing the address of the track last accessed and the track currently being accessed, and

means for forming the absolute difference between said last and currently accessed track addresses and for storing a function of the difference as the track seek time in said storage means for the page location storing data from said currently addressed track

means operable when the tracks are to be reordered for requiring said means for selectively rewriting to rewrite each page without regard to whether a change has been made in a page,

means for calculating the average seek time for said page locations, means for providing a reference value of track seek time and means for comparing said average seek time with said reference seek time, said means for comparing providing a binary-valued signal signifying that the pages are to be reordered on the tracks of the disk for reduced seek time when said average reaches said reference or signifying that said average is below said reference, and

means in said page transferring means for identifying a set of disk tracks available for storing the pages from memory, and means operable in response to said signal that the pages are to be reordered for controlling said page transferring means for rewriting the pages into a physical sequence of said available tracks according to the sequence of pages in said queue,

whereby after said reference is reached the pages transferred to the disk from main memory are physically reordered on the disk in the sequence in which they were previously fetched from the disk and whereby subsequently fetching the same pages in approximately the same order may improve the average seek time.

4,680,704

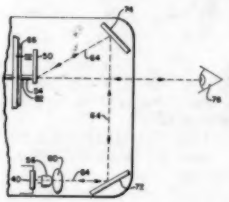
OPTICAL SENSOR APPARATUS AND METHOD FOR REMOTELY MONITORING A UTILITY METER OR THE LIKE

Lawrence R. Konicek, Richfield; Steven K. Case, St. Louis Park, and Gerald M. Kackman, St. Paul, all of Minn., assignors to TeleMeter Corporation, Minneapolis, Minn.

Filed Dec. 28, 1984, Ser. No. 687,089

Int. Cl.[4] G01B *11/2*; G01R *11/00*; G01K *9/00*

U.S. Cl. 364—525 **20 Claims**



19. An optical sensor apparatus for reading a meter having

one or more indicators representative of the meter reading; comprising:

a. light source means for providing a source of light, the light source means directing the light generally toward a faceplate of the meter;

b. lens means for focusing the light reflected off the meter faceplate;

c. optically sensitive image detector means for receiving the light focused thereon by the lens means including an array of light sensitive elements; and

d. control means operatively interconnected to the image detector means for receiving signals from the image detector means representative of the light intensity to which the light sensitive elements of the image detector means are exposed and for creating a digitized image of the meter faceplate based on the signals received from the image detector means, said control means further including storage means for storing the digitized image of the meter faceplate, said control means including shutter means for controlling the exposure of the image detector means to the reflected light.

4,680,705

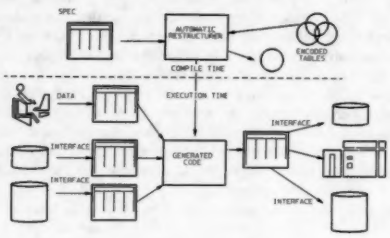
AUTOMATIC DATA RESTRUCTURER

Nan-Chiang Shu, Rolling Hills, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,868

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—300 **9 Claims**



1. In an electronic information processing system where input and output data structures are prespecified, a method for generating object code, which object code conforms the input data into the output data structure at execution time, comprising the steps of:

(a) ascertaining in said system the shape of a given input and output data structure as being either (1) of a flat form, (2) of a one-branch form, or (3) of a tree form;

(b) determining in said system a minimal subset of operations selected from a set of operations consisting of trimming, flattening, grafting, or stretching for conforming the input into the output data structure according to the difference in ascertained shapes;

(c) determining in said system each instance when a selected operation is to be invoked; and

(d) executing in said system the order of operations specified by steps (a) through (c) upon said input data structure.

4,680,706

RECLOSER CONTROL WITH INDEPENDENT MEMORY

Thomas J. Bray, Shaker, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed May 31, 1984, Ser. No. 615,563

Int. Cl.[4] G01R *19/00;* **H01H** *47/00*

U.S. Cl. 364—492 **8 Claims**

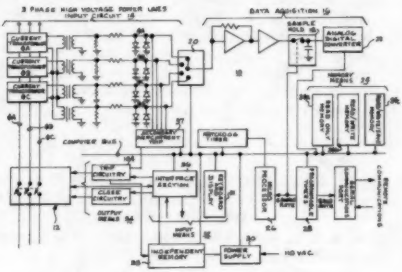
1. A recloser control comprising:

an input circuit for sensing current in each phase of a power line comprised of a first phase, a second phase, a third phase and a ground, and for sensing current in the ground, and providing an analog signal corresponding to the current in each of said phases and said ground;

a data acquisition means including a sample and hold circuit for sampling the analog outputs of the input circuit and maintaining each analog output sampled for a desired preselected holding period, and an analog to digital converter for converting the analog output of the sample and hold circuit to a digital form, said digital form providing an input signal to a processing means;

memory means for storing command information in digitized form including normalizing references, time current characteristics, instantaneous trip values, number of operations associated with a given time current characteristic, time intervals for selected measurements and operations, and status information such as digitized current magnitudes from said data acquisition means;

processing means for generating an equivalent to a mean square value for each input signal from said data acquisition means, comparing the mean square equivalent values of the inputs with a preselected one of a number of time current characteristics stored in memory means in accordance with other command information stored in the



memory means, and issuing an operation command which causes a recloser to change its state between close and trip conditions;

a power supply for selectively supplying power to the other portions of the recloser control from the power line being protected, said power supply including a storage means to supply power when the power lines being protected are interrupted;

output means for activating trip means in the recloser in accordance with operation commands from the processor means or trip signal from the secondary overcurrent trip circuitry, or close means in the recloser in accordance with operational commands from the processor means;

input means for entering command information; and

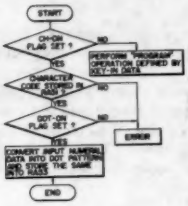
independent memory means interconnected among said power supply storage means, said processor means and said input means, said independent memory means supplying information to said processor means and being alterable by said processor when said processor means is supplied sufficient operating power and, being alterable by said input means, when said processor means is not supplied sufficient operating power.

4,680,707

ELECTRONIC CASH REGISTER AND METHOD FOR DEFINING PRINT CHARACTERS

Yuji Iida, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,449
Claims priority, application Japan, Feb. 6, 1984, 59-19791
Int. Cl.[4] G07G 1/12; G06F 15/22
U.S. Cl. 364—405 15 Claims



1. An electronic cash register comprising:

a keyboard having indicia keys including numeral keys, first to fourth function keys and department keys;

mode setting means having a registration mode and a program mode;

dot printing means for executing a printing operation in accordance with a received dot pattern having dots placed in lines forming a matrix of rows and columns;

first memory means for storing a plurality of character codes to designate selected characters and storing a plurality of character patterns representing, respectively, a plurality of said selected characters, each stored character pattern being formed with said lines of dots forming a matrix of rows and columns;

second and third memory means; and

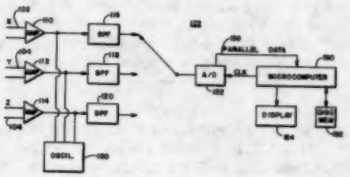
data processing means for, when the mode setting means is set in said registration mode, generating sales data in response to a key operation in said keyboard and storing it into said second memory means, reading out a character pattern from said first memory means in accordance with said sales data and supplying it to the dot printing means, and when the mode setting means is set in said program mode, said data processing means storing data which is generated by operating said indicia keys and said first function key into said third memory means as character code data, storing line address data which is generated by operating the indicia keys and said second function key, storing into the third memory means a character pattern which is produced by operating selected ones of the indicia keys to each of which has been assigned a unique identity corresponding to only one dot in at least one of said lines of the matrix of rows and columns, and reading out the character pattern stored in said third memory means in response to the operation of said fourth function key and storing said character pattern into a memory area in said first memory means that is designated by the character code data stored in the third memory means.

4,680,708

METHOD AND APPARATUS FOR ANALYZING ELECTROCARDIOGRAPHIC SIGNALS

Hans D. Ambos; Michael E. Cain, and Burton E. Sobel, all of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 591,647, Mar. 20, 1984, abandoned. This application Nov. 5, 1984, Ser. No. 668,245
Int. Cl.[4] A61B 5/04; G06F 15/42
U.S. Cl. 364—417 35 Claims



1. A method for analyzing electrocardiogram (ECG) signals to determine the presence or absence of a predetermined frequency content in a preselected portion of said ECG signals comprising the steps of:

converting analog ECG signals to digital ECG signals;

performing a fast Fourier transform (FFT) on said preselected portion of said digital ECG signals; and

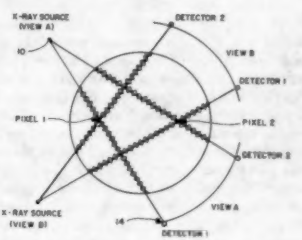
determining a figure of merit (FOM) associated with the frequency content of said at least a preselected portion of said ECG signals from said output of said Fourier transform step, whereby said determination of the presence or absence of said predetermined frequency content can be determined from the vaule of said FOM.

4,680,709

BACK PROJECTION IMAGE RECONSTRUCTION APPARATUS AND METHOD

Nallaswamy Srinivasan; Sharon L. Banaszewski, both of Waukesha, and Kishore C. Acharya, West Ellis, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 13, 1984, Ser. No. 670,595
Int. Cl.[4] G06F 15/42; G06G 7/60
U.S. Cl. 364—414 10 Claims



1. Circuitry for calculating pixel values from detector measurements in a CT scanner and the like in which a plurality of detectors measure attenuated radiation from a fan beam radiation source for consecutive projection views along a plane through an object located between said source and said plurality of detectors, said circuitry comprising

means for identifying by calculation a detector for use in back projection through a first pixel in a first view,

means for identifying by calculation a detector for use in back projection through said first pixel for a second view,

means for identifying through interpolation a detector for use in back projection through said pixel for views inter-

mediate said first and second views based on said calculated detector identifications for said first pixel,

means for identifying a detector for use in back projection through a second pixel for said first view,

means for identifying a detector for use in back projecting through said second pixel for said second view,

means for identifying by interpolation a detector for use in back projecting said second pixel for views intermediate said first and second views based on said calculated detectors for said second pixel, and

means for identifying by interpolation detectors for use in back projecting through pixels intermediate said first and second pixels for said first and second views and views therebetween based on said identified detectors for use in back projecting through said first and second pixels.

4,680,710

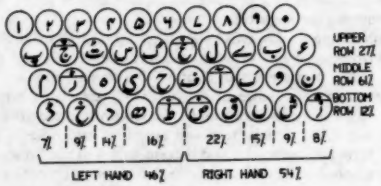
COMPUTER COMPOSITION OF NASTALIQ SCRIPT OF THE URDU GROUP OF LANGUAGES

Akeel H. Kizilbash, 2/51-G,P.E.C.H.S., Karachi-29, Pakistan

Filed Nov. 19, 1984, Ser. No. 673,195

Int. Cl.[4] G06F *15/38, 7/60;* **G09G** *1/18;* **B41J** *5/00*

U.S. Cl. 364—419 **13 Claims**



1. A method for computer composing the Urdu group of languages in true Nastaliq script in a highly esthetic manner conforming to the style and elegance of the traditional norms and conventions of the script, which comprises:

(a) expanding the character set of the Urdu group of languages by the inclusion of additional whole characters and allocating a key for said characters on a computer keyboard entry device, said keyboard having Urdu characters mapped to said keys by matching frequency of occurrence of a character with finger agility, by pattern recognition of similar characters, by rationalizing finger workload, and by minimal use of a shift key;

(b) storing in the computer memory digitized constituent elements of every whole character of the expanded set of said Urdu group of languages and every shosha having a representative shape of a whole character when joined together in a ligature as a combination of a Common Body Group having common body shapes, a Rest Body Group having a portion of a character joined with their respective common body to complete the whole character body, and a Diacritic Mark Group having means for identifying a specific member of a particular character family;

(c) defining a set of rules and their application in a computer program for automatically selecting, composing, and combining the computer stored characters and shoshas, for detecting End of Ligature special characters for ending ligatures, for minimum interligature spacing, for proper vertical positioning of characters and ligatures, and for correct positioning of Araabs having means for identifying Urdu vowel sounds, all according to the conventions of the script;

(d) entering into the computer with the keyboard entry device an interword space after each character to compose the whole character and omitting said interword space for combining commonly occurring pairs of words;

(e) bit mapping the wholly formed word "Allah" and assigning said word a key on said keyboard;

(f) displaying on the computer screen whole characters from right to left with a screen blinking cursor in a space at the beginning of a word, formation of the word by entry of space, and movement of the cursor to the space at the end of the word;

(g) shifting numerals from right to left on the computer display screen thereby maintaining their left to right order as entered; and

(h) repositioning tall ligatures for proper vertical and language orientation on the computer display screen to avoid interline overlap.

4,680,711

CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

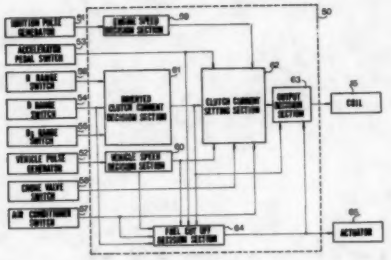
Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B. V., RA Tilburg, Netherlands

Filed Jan. 29, 1985, Ser. No. 695,977

Claims priority, application Japan, Feb. 1, 1984, 59-17296

Int. Cl.[4] B60K *41/22;* **F02D** *29/02;* **F16D** *27/16*

U.S. Cl. 364—424.1 **5 Claims**



1. A system for controlling an infinitely variable transmission for an engine mounted on a vehicle comprising:

an electromagnetic clutch for connecting a crankshaft of the engine with an input shaft of the transmission;

first means for sensing vehicle speed and for producing a signal when the vehicle speed exceeds a predetermined value;

second means for detecting the neutral state of the transmission;

third means for detecting the forward drive state of the transmission;

fourth means for detecting a released position of an accelerator pedal of the vehicle;

fifth means for cutting off fuel under conditions of existence of output signals of the first means, third means and fourth means; and

sixth means for disengaging the electromagnetic clutch with a delay in response to an output signal of the second means under the condition of fuel cut off.

4,680,712

SYSTEM FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR A VEHICLE

Ryuzo Sakakiyama, Tokyo, and Toshio Takano, Hamura, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 695,978

Claims priority, application Japan, Jan. 31, 1984, 59-15421

Int. Cl.[4] B60K *41/22;* **F16D** *27/16*

U.S. Cl. 364—424.1 **4 Claims**

1. A system for controlling an electromagnetic clutch for a motor vehicle having an infinitely variable belt-drive transmission which has a drive range, a reverse range and a neutral range, and a selector lever for selecting the ranges, the system comprising:

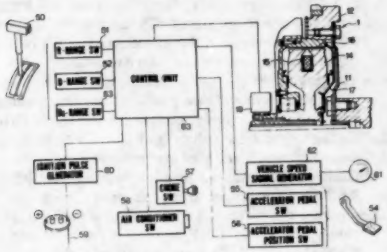
vehicle speed detecting means for producing a vehicle speed signal;

first switch means for detecting the position of the selector lever and for producing output signals depending on the reverse range, drive range a neutral range;

second switch means for producing output signals dependent on depression and release of an accelerator pedal of the vehicle;

first means for producing a reverse clutch current signal dependent on a signal of the first switch means indicative of a neutral position of the selector lever;

second means for producing a vehicle start clutch current signal dependent on the signal from the second switch



means at the depression of the accelerator pedal and on a signal from the vehicle speed detecting means at a low vehicle speed;

third means for producing a small drag current signal dependent on the signal at low vehicle speed and on the signal from the second switch means at the release of the accelerator pedal;

fourth means for producing a lock-up engage current signal dependent on the signal at middle and high vehicle speed; and

output decision means applied with each of the current signals for controlling the current passing through a coil in the electromagnetic clutch in dependency on the applied current signal.

4,680,713

ANTI-SKID BRAKE CONTROL SYSTEM WITH OPERATION CONTROL FOR A PRESSURE REDUCTION FLUID PUMP IN HYDRAULIC BRAKE CIRCUIT

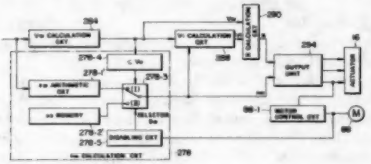
Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,329

Claims priority, application Japan, May 16, 1983, 58-84087; May 16, 1983, 58-84091

Int. Cl.[4] B60T *8/34*

U.S. Cl. 364—426 **5 Claims**



1. An anti-skid brake control system for an automotive vehicle comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking pressure to a vehicle wheel;

a pressure control valve disposed within said hydraulic brake circuit for increasing the fluid pressure in said wheel cylinder in a first position thereof, decreasing the fluid pressure in a second position thereof and holding the fluid pressure at a constant value in a third position thereof;

first means for detecting wheel speed and producing a first signal having a value representative of the wheel speed;

a second means for detecting wheel acceleration and producing a second signal having a value representative of the wheel acceleration;

a third means, responsive to said first and second signals, for deriving a control signal for selecting one of said first, second and third positions of said pressure control valve, said third means being responsive to said second signal value decreasing less than a given deceleration threshold to initiate derivation of said control signal for selecting said third position, said deceleration threshold serving as a criteria for initiating anti-skid brake control;

a fourth means receiving said first signal for producing a command to replace said second signal value by a predetermined value which is representative of a lesser deceleration value than said deceleration threshold when said first signal value becomes less than a given wheel speed threshold which is representative of a low wheel speed criteria; and

a fifth means for detecting the presence of said control signal selecting said third position for disabling said fourth means when anti-skid control is performed.

4,680,714

ANTI-SKID BRAKE CONTROL SYSTEM WITH REDUCED DURATION OF WHEEL ACCELERATION AND DECELERATION CALCULATION

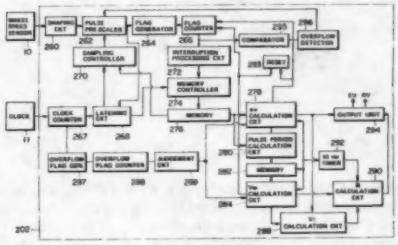
Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,364

Claims priority, application Japan, Apr. 23, 1983, 58-70900

Int. Cl.[4] B60T *8/34*

U.S. Cl. 364—426 **25 Claims**



1. An anti-skid brake control system for an automotive vehicle comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel;

a pressure control valve disposed within said hydraulic brake circuit and operative to increase fluid pressure in said wheel cylinder in a first position and to decrease fluid pressure in said wheel cylinder in a second position;

a wheel speed sensor means for producing a sequence of sensor signal pulses separated by intervals, said intervals representative of the detected wheel rotation speed;

a timer means for producing a timer signal;

a first means, responsive to said sensor signal pulses, for sampling a value of said timer signal at a given number of sensor signal pulses so as to detect input timing of said given number of said sensor signal pulses and storing the sampled input timing, said first means deriving said given number of sensor signal pulses so that an interval of sam-

pling of said timer signal value becomes greater than a predetermined value which represents a minimum sampling interval for allowing precise calculation of wheel acceleration;

a second means for processing values of said stored input timing and for deriving wheel speed, wheel acceleration and other brake control parameters based on said stored input timing values and, in response to said derived brake control parameters, for producing a control signal controllably selecting one of said first and second positions of said pressure control valve to operate said pressure control valve to the selected valve position;

a third means for governing operations of said first and second means, said third means being responsive to said sensor signal pulses to interrupt operation of said second means and activate said first means, said third means further governing operation of said first means for sampling and temporarily storing three successive input timing values corresponding to three successive sensor signal pulses, and governing operation of said second means for performing calculation of wheel acceleration with respect to the temporarily stored input timing values.

4,680,715

METHOD FOR NAVIGATING VEHICLES, PARTICULARLY LAND VEHICLES

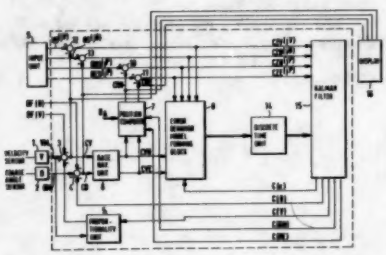
Bernd-Christian Pawelek, Wiesloch, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,141

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418081

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—449 **3 Claims**



1. A method for the navigation of a vehicle, the vehicle including: course reference means for furnishing a course angle signal θM which represents the direction of the vehicle with reference to an earth-bound coordinate system; longitudinal movement sensor means for detecting longitudinal movement of the vehicle and generating a longitudinal movement signal VM corresponding to the longitudinal movement of the vehicle; position computer means for calculating vehicle position data, segragated into north and east position values, from signals generated by the course reference means and the longitudinal movement sensor means; display means connected to the position computer for displaying vehicle position data calculated by the position computer; and input means including at least one of manual input means and signal receiving means for providing navigation support data including at least one of additional position, course, velocity and path data; said method comprising:

checking the longitudinal movement signal VM and the course angle signal θM for plausibility;

adding a known, empirically derived, deterministic velocity error component value DF(V) to the VM signal to produce, a corrected longitudinal movement signal CV;

optimally estimating, with the use of a Kalman filter, the stochastic position and direction errors contained in the VM and θM signals and using the estimate of such errors to calculate direction and change-in-direction correction values $C(\theta)$ and $C(\epsilon)$, respectively, and north and east position correction values C(RN) and C(RE), respectively;

adding the direction correction value $C(\theta)$ and a known, empirically derived, deterministic course angle error component value $DF(\theta)$ to the θM signal to produce a corrected course angle signal $C\theta$;

feeding the position correction values C(RN) and C(RE) to the position computer means for use in correcting the position data;

forming corrected north and east component signals CVN and CVE, respectively, from the corrected longitudinal vehicle movement signal CV and from the corrected course angle signal $C\theta$ and feeding the CVN and CVE signals to the position computer means;

calculating, with the use of the position computer means, corrected north and east position coordinate values CRN and CRE, respectively, in dependence of the C(RN) and C(RE) correction values and the CVN and the CVE corrected north and east component signals;

obtaining north and east position bearing data $RNS^{(iP)}$ and $RES^{(iP)}$, respectively, from the input means;

comparing the corrected north and east position coordinate values CRN and CRE with the position bearing data $RNS^{(iP)}$ and $RES^{(iP)}$, respectively, to form north and east position bearing signals $CZN^{(iP)}$ and $CZE^{(iP)}$, respectively; and

feeding the $CZN^{(iP)}$ and $CZE^{(iP)}$ signals to the Kalman filter, with the Kalman filter developing the following error model of the vehicle course angle error:

$$\Delta\theta(i)=\Delta\theta_1(i)+\Delta\theta_2(i)+\Delta\theta_3(i),$$

wherein $\Delta\theta_1(t)$ comprises a component of exponentially, time correlated, colored noise; $\Delta\theta_2(t)$ comprises a time linearly variable component representing drift angle with an unknown starting value $\Delta\theta_2(0)$ and an unknown pitch $\epsilon(t)$ representing a random ramp process; and $\Delta\theta_3(t)$ comprises a component of Gaussian white, time uncorrelated, noise; and wherein the component $\Delta\theta_1(t)$ is described by a form filter excited with white noise in a Gauss-Markov process of the first order; and error which is contained in the position bearing data, $RNS^{(iP)}$ and $RES^{(iP)}$ is developed solely by stationary Gaussian white, time uncorrelated, noise.

4,680,716

AUTOMATIC METHOD AND APPARATUS FOR DOSING SAMPLES

Alain Naudi, Chelles, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,448

Claims priority, application France, Dec. 2, 1983, 83 19290

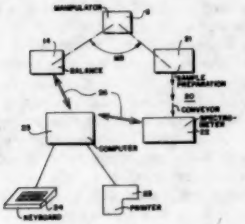
Int. Cl.[4] G06F *15/46*; G01N *1/28*

U.S. Cl. 364—468 **13 Claims**

1. An apparatus for automatically dosing a mixture of a sample and a fluxing comprising

first means for continuously weighing sample material and a flux, first hopper means having a vibrator and chute for feeding said flux, second hopper means having a vibrator and chute for feeding said sample material, second means for automatically controlling said weighing of said sample material and said flux, a weighing structure controlled by said second means, third means having a manipulator arm with a gripper for manipulating said weighing structure, said vibrator for said first hopper means being a two-rate vibrator and said vibrator for said second hopper means being a two-rate vibrator, and said second means being programmable to select one of sample weight EC, a tolerance between a real sample weight relative to EC, a pre-

determined value RFEC of a ratio of flux weight FC1+FC2 to said sample weight EC, and a maximum



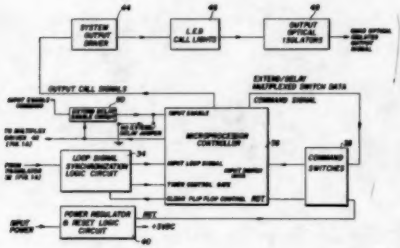
permissible deviation between RFEC and an obtained value of said ratio.

4,680,717

MICROPROCESSOR CONTROLLED LOOP DETECTOR SYSTEM

Marshall H. Martin, Northridge, Calif., assignor to Indicator Controls Corporation, Gardena, Calif.

Filed Sep. 17, 1984, Ser. No. 651,480
Int. Cl.[4] G08G *1/07, 1/01*
U.S. Cl. 364—436 **3 Claims**



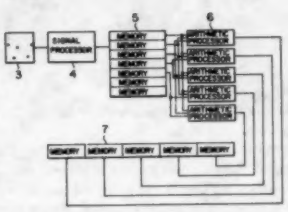
1. A microprocessor controlled detection system connected to a plurality of inductive loops buried in a road bed and used to detect the presence of motor vehicles over the respective loops, said system comprising: a common oscillator circuit for generating an output signal of a particular frequency which is subject to change when a motor vehicle passes over any one of the loops; a switching circuit for connecting respective ones of the loops on a sequential and cyclic basis to the oscillator circuit; a microprocessor controller connected to said switching circuit for supplying switching signals to said switching circuit to enable said switching circuit sequentially and cyclically to connect the loops to said oscillator circuit; an input circuit connecting said microprocessor controller to enable said microprocessor controller to count the cycles of the output signal from said oscillator as said loops are sequentially and cyclically connected to said oscillator; an output circuit connected to said microprocessor controller for providing a plurality of separate output call signals in response to cycles of said output signal counted by said controller to indicate when a change has occurred in the frequency of the output signal from said oscillator beyond a pre-selected threshold when corresponding ones of said loops are connected to said oscillator circuit; means in said microprocessor controller for providing a null time between each connection of said loops to said oscillator circuit by said switching circuit; circuit means included in said input circuit for synchronizing the oscillator with the microprocessor controller so that the count by the microprocessor controller will commence upon the occurrence of a particular transition of the oscillator output signal after the controller has been conditioned to make a count after a particular loop has been connected to the oscillator by said switching circuit; and a plurality of manually-operated command switches connected to said microprocessor controller, in which the manually-operated command switches include a plurality of on-off switches for deactivating different channels of said system, and means in said microprocessor controller responsive to the settings of the on-off switches for causing said microprocessor controller to supply switching signals to said switching circuit corresponding to less than all of the channels and without any dead time for the de-activated channels.

4,680,718

METHOD AND APPARATUS OF DETERMINING AN ATTITUDE OF A SATELLITE

Toshiro Sasaki, Yokohama, Japan; Michitaka Kosaka, Austin, Tex.; Satoshi Mohri, Tokyo, Japan; Katsumi Kawano, Fuchu, Japan, and Shoji Miyamoto, Kawasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,428
Claims priority, application Japan, Nov. 11, 1983, 58-212202
Int. Cl.[4] G06F *7/56*
U.S. Cl. 364—455 **6 Claims**



1. A method of determining the attitude of an object in an attitude control system using a star sensor, comprising the steps of:

(a) calculating predetermined features of images detected by said star sensor by means of a processor;

(b) storing predetermined features in a star catalogue of the universe in the form of a table of feature data including numeric data calculated from the position and brightness of selected stars with respect to at least one adjacent star so as to make it easy to search said features in said star cataglogue; and

(c) comparing said calculated features with the features stored in said table, thereby determining the attitude of the object.

4,680,719

METHOD OF CONTROLLING COMB-CUTTER LATHE

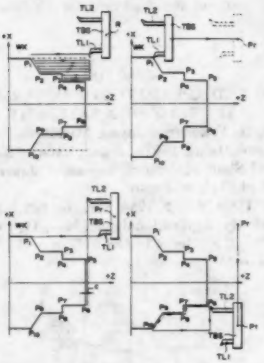
Hajimu Kishi; Masaki Seki, and Takashi Takegahara, all of Tokyo, Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP83/00373, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01730, PCT Pub. Date May 10, 1984
PCT Filed Oct. 25, 1983, Ser. No. 621,925
Claims priority, application Japan, Oct. 25, 1982, 57-187299
Int. Cl.[4] G05B *19/00;* G06F *15/00*
U.S. Cl. 364—474 **5 Claims**

1. A method of controlling a comb-cutter lathe having a tool rest movable in an X-Z orthogonal coordinate system, the tool rest having two or more juxtaposed tools mounted thereon for subjecting a workpiece, having a turning axis coinciding with the Z-axis, to machining by using predetermined ones of the tools in succession, such that after machining is completed in a first quadrant by one tool the tool rest is moved in order to

position another one of the tools at a machining location in a second quadrant and machining is preformed by the other tool, said method comprising the steps of:

(a) automatically moving the tool rest along the Z-axis to a point P_r at which none of the tools will contact the workpiece when the tool rest is moved along the Z-axis from the first quadrant to the second quadrant, a Z-axis coordinate value of the point P_r being determined in accordance with a maximum length of said juxtaposed tools;



(b) selecting one of the tools for machining the workpiece in the second quadrant;

(c) automatically moving the tool rest along the X-axis from the point P_r to a point P_b in the second quadrant at which an X-axis position of the selected tool coincides with an X-axis coordinate value of a machining starting point at which machining is to be started by the selected tool; and

(d) performing machining in the second quadrant using the selected tool.

4,680,720

DOT INTERPOLATION CONTROL SYSTEM

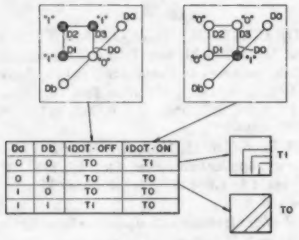
Jiro Yoshii, Saitama; Akira Komatsu, and Hiroshi Ishii, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 15, 1984, Ser. No. 661,192

Claims priority, application Japan, Oct. 17, 1983, 58-193752; Oct. 17, 1983, 58-193753; Oct. 17, 1983, 58-193754; Oct. 17, 1983, 58-193755; Oct. 17, 1983, 58-193756; Oct. 17, 1983, 58-193757; Oct. 17, 1983, 58-193758

Int. Cl.[4] G06F *15/66*; H04N *1/04*

U.S. Cl. 364—521 **16 Claims**



15. A dot pattern interpolation system, comprising:

a dot pattern memory for storing character pattern data consisting of a predetermined dot matrix format;

dot data obtaining means for obtaining dot data of four adjacent dots of a desired position from said dot pattern memory;

interpolated value obtaining means for obtaining an interpolated value consisting of a plurality of bits in a region surrounded by said four adjacent dots from said dot data of said four adjacent dots;

memory means for storing a comparing value for making a comparison with said interpolated value; and

interpolated value compared means for comparing said interpolated value with said comparing value, and obtaining a discrimination output representing an OFF-dot, or ON-dot, said discrimination output being controlled by changing said comparing value stored in said memory means and said comparing value of said memory means being changed in accordance with an enlargement/reduction ratio for said dot pattern.

4,680,721

CIRCUIT ARRANGEMENT FOR GENERATING AN ELECTRIC VELOCITY SIGNAL

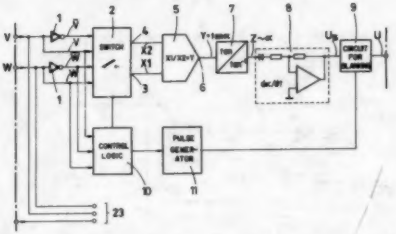
Gerhard Pluddemann, Nussbach, Fed. Rep. of Germany, assignor to Mavilor Systemes S.A., Switzerland

Filed Nov. 28, 1984, Ser. No. 675,842

Claims priority, application Switzerland, Dec. 22, 1983, 6853/83

Int. Cl.[4] G01P *3/42*; G01R *23/00*

U.S. Cl. 364—565 **6 Claims**



1. Circuit arrangement for generating an electric velocity signal which is proportional to the velocity of a moving part and particularly to the speed of rotation of a rotating part, consisting of two continuous input signals (w, v) which are periodically changeable as a function of the position of this moving part, and particularly of the angle of rotation (ϕ), and which are phase-shifted with respect to each other by approximately 90°, both having each in the mean the same frequency and a constant amplitude ratio and a sinusoidal or sine-like characteristic, a simple or integral multiple (N) of the duration of the period (T) of one input signal (w, v) being equal to the time in which the moving part covers a certain distance and particularly a rotating part carries out one full revolution, comprising:

(a) an inversion circuit (1) for inverting the two input signals (w, v);

(b) a curve change-over switch (2) having inputs for the input signals (w, v) and the inverted input signals ($\overline{w}$, $\overline{v}$) and having a first and a second output (3, 4) which are connected in predeterminable sequence with respective similar sections of the input and inverted input signals, retaining their relative phase relationships, one signal sequence of periodically repetitive signal sections (x1 and x2, respectively) each appearing at the first and at the second output (3, 4), which signal sections are in a range of values which is suitable for dividing the first signal section (x1) electrically by the second signal section (x2);

(c) a dividing circuit (5) which is connected to the outputs (3, 4) of the curve change-over switch (2) and which will divide in each case the signal section (x1) originating from the first output (3) by the signal section (x2) originating

from the second output (4) whilst forming a sequence of quotient signals (y) which correspond to finite sections of a variation with time of a tangent function or of a tangent-like function of the path co-ordinate of the moving part and especially of the angle of rotation ($\alpha = N.\phi$);

(d) a tangent/arc tangent converter circuit (7) which follows the divider circuit (5), for converting the quotient signals (y) into a sequence of path signals (z) which correspond to the arc tangent function or to an arc tangent-like function of these quotient signals (y) and in each case represent the variation of the path co-ordinates and particularly of the angle of rotation (α) as a function of time (t) within successive intervals defined by the signal sections (x1, x2);

(e) a first differentiating circuit (8) which follows the converter circuit (7), for differentiating the path co-ordinates represented by the path signals (z), particularly of the angle (α) after time (t), a sequence of voltage sections u_z being formed which are interrupted by step positions and the voltage of which is proportional to the velocity of the moving part; and

(f) a circuit (9) which blanks out the step positions and which supplies an analog voltage (u) which is proportional to the velocity of the moving part, said circuit (9) being connected to and processing the output of said differentiating circuit (8).

4,680,722

ARRANGEMENT FOR DETERMINING THE STARTING INSTANT OF THE LEADING EDGE OF A HIGH-FREQUENCY PULSE

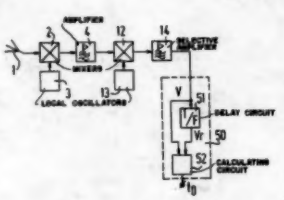
Jean-Pierre Tomasi, Les Molieres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,150

Claims priority, application France, Feb. 15, 1984, 84 02284

Int. Cl.[4] H04N *3/14*

U.S. Cl. 364—569 **7 Claims**



1. An arrangement for determining the starting instant t_o of the leading edge of a received high-frequency pulse signal V of the form $V = A.(t - t_o).\sin 2\pi Ft$, where V is the instantaneous voltage, A is the slope of the leading edge, t is the time ($t > t_o$), and F is the frequency,

said arrangement comprising:

(a) receiving means for receiving the pulse signal V;

(b) delay means electrically connected to the receiving means for delaying the received pulse signal V by a time equal to k/2F (where k is an integer) and thereby producing a second pulse signal V_R of the form $V_R = A.(t - t_o - k/2F).\sin 2\pi$; and

(c) processing means electrically-connected to the receiving means and to the delay means for determining t_o from the signals V and V_R by performing the calculation

$$t - \frac{k(-1)^k V}{2F[(-1)^k V - V_R]}$$

and for producing a signal representative of t_o.

4,680,723

SIGNAL PROCESSOR FOR MATRIX ARRAYS

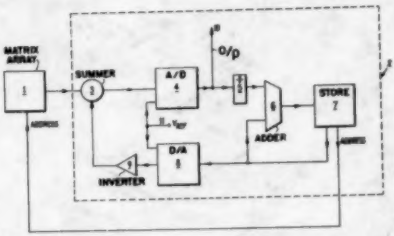
David T. Whinray, and Gwilym J. Tilsley, both of Hatfield, England, assignors to British Aerospace PLC, London, England

Filed Oct. 11, 1984, Ser. No. 659,957

Claims priority, application United Kingdom, Oct. 14, 1983, 8327594

Int. Cl.[4] G01T *1/20*

U.S. Cl. 364—571 **5 Claims**



1. A signal processing system for applying offsets to analog input signals received one after another from a plurality of signal forming elements to compensate for any differences in the characteristics of the different elements, the system comprising:

subtracting means having a first input for receiving said analog input signals and having a second input for receiving further analog signals for forming difference signals dependent upon said input signals minus values dependent upon said further analog signals;

N-bit analog to digital converter means connected to the subtracting means for forming N-bit digital signals representative of successive samples of said difference signals;

digital signal adding means having two inputs and an output, one of said two inputs being connected to the analog to digital converter means for receiving said N-bit digital signals and the adding means supplying at its output the sum values of signals applied to its two inputs;

store means connected to the output and the other of said two inputs of the adding means, the store means having a plurality of storage locations corresponding to respective ones of said signal forming elements for storing at said locations respective sum values received from the output of the adding means and also for supplying the stored sum values to said other input of the adding means to initiate the formation of new sum values by the adding means; and

M-bit digital to analog converter means connected to said store means and said second input of the substracting means for receiving M-bit digital sum values read from the storage locations of the store means and for converting them to form said further analog signals, the number of bits M being greater than N.

4,680,724

SHEET-LIKE MINIATURIZED ELECTRONIC DEVICE

Kazuhiro Sugiyama, and Tatsuo Shimazaki, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,581, May 2, 1983, abandoned. This application Feb. 4, 1986, Ser. No. 825,953

Claims priority, application Japan, Dec. 3, 1982, 57-212150

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.[4] G06F *15/02*

U.S. Cl. 364—708 **16 Claims**

1. A flat miniaturized electronic device comprising:

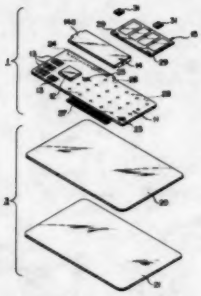
a flat and thin insulating sheet with a conductive wiring pattern thereon;

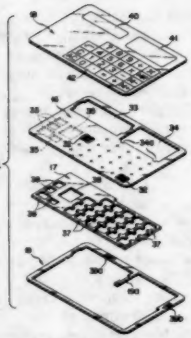
an electronic component coupled to said conductive wiring

pattern, said electronic component having one end surface in the same plane as a first face of said insulating sheet with its opposite end surface projecting from the plane of a second face of said insulating sheet opposite to said first face;

a first cover mounted opposite to the first face of said insulating sheet and having key indicia thereon;

switch means between said first cover and the first face of said insulating sheet for actuating an electrical connection





to said conductive wiring pattern upon contact of said key indicia by an operator;

a second cover having a flat outer surface and the same periphery as said first cover and mounted opposite to the second face of said insulating sheet so as to form a gap between the second cover and, respectively, the second face of said insulating sheet and the projecting end surface of said electronic component; and

an adhesive layer filling said gap.

4,680,725

DUAL FUNCTION DECIMAL KEY

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

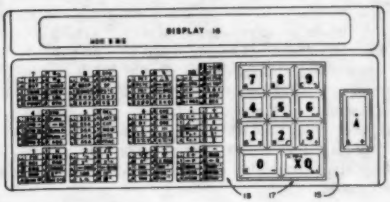
Continuation of Ser. No. 459,997, Jan. 21, 1983, Pat. No. 4,567,567. This application Sep. 25, 1985, Ser. No. 779,923

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] G06F *3/027*

U.S. Cl. 364—709 **7 Claims**

1. In a computer for performing a plurality of operations with a decimal point key located on a keyboard having numerical digit entry keys to enter in sequence a set of numerical digits to form a numerical word and key responsive means operating the computer in several modes including a data entry mode in which selected aritmetic calculation functions are produced from instructions manually entered by the keyboard, the combination comprising, decimal point entry means including said decimal point key and a data processing system operable to make a decimal point entry from the decimal point key with the computer operating in the computer data entry mode, function exexcuting means for processing the numberical word in accordance with said selected arithmetic calculation func-



tions, and circuit means connected to said function executing means for initiating one of said selected arithmetic calculation functions in response to operation of the decimal point key a second time within said numerical word for initiating a data manipulation operation of the numerical digits of that word by the computer to arithmetically employ the numerical digits in an arithmetic calculation function performed by the function executing means.

4,680,726

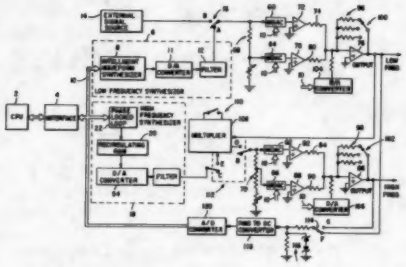
FUNCTION GENERATOR

Jacob H. Malka, Fair Lawn, and Marc Osetec, Wood-Ridge, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 18, 1984, Ser. No. 662,320

Int. Cl.[4] G06F *1/02*; H03C *1/00*

U.S. Cl. 364—721 **17 Claims**



1. A function generator, characterized by:

means for providing a low frequency output function signal;

means for providing a high frequency output function signal;

means responsive to the low frequency output function signal for providing a high resolution, low frequency output function signal;

means responsive to the high frequency output function signal for providing a high resolution, high frequency output function signal;

means for combining the high frequency output function signal and the high resolution, low frequency output function signal for providing an amplitude modulated signal; and

switching means connected to the high frequency output function signal means and the combining means, and selectively operating for connecting the high frequency output

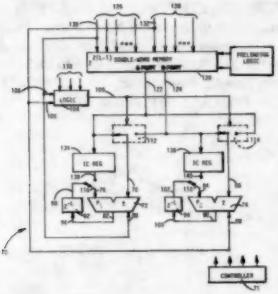
function signal to the combining means, and for disconnecting said signal from said combining means.

4,680,727

COMPLEX MULTIPLIER FOR BINARY TWO'S COMPLEMENT NUMBERS

Stanley A. White, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1984, Ser. No. 653,179
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—754 20 Claims



12. An apparatus for performing complex multiplication of a complex multiplier comprising a multiplier real portion and a multiplier imaginary portion, and a complex multiplicand comprising a multiplicand real portion and a multiplicand imaginary portion, wherein said multiplicand real portion comprises a plurality of real L-bit subwords and said multiplicand imaginary portion comprises a plurality of imaginary L-bit subwords, wherein L is greater than 1, and wherein said complex multiplication apparatus comprises:

(a) a memory having first and second output ports, wherein said memory has stored in it first and second numbers representative of said complex multiplier so that when said memory is addressed with a pair of said real and imaginary L-bit subwords, a first memory output is produced at said first memory output port and a second memory output is produced at said second memory output port;

(b) a first adder/subtractor having an output port, a first input port connected to said first memory output port for receiving said first memory output, and a second input port connected to said output port for receiving a first recirculation input, wherein said first adder/subtractor combines said first memory output and said first recirculation input to produce a first adder/subtractor output on said output port;

(c) a first scaling multiplier connected to said first adder/-subtractor between said output and said second input to shift said first adder/subtractor output L bits;

(d) a second adder/subtractor having an output port, a first input port connected to said second memory output port for receiving said second memory output, and a second input port connected to said output port for receiving a second recirculation input, wherein said second adder/-subtractor combines said second memory output and said second recirculation input to produce a second adder/subtractor output on said output port; and

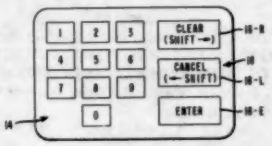
(e) a second scaling multiplier connected to said second adder/subtractor between said output and said second input to shift said second adder/subtractor output L bits.

4,680,728

USER-FRIENDLY TECHNIQUE AND APPARATUS FOR ENTERING ALPHANUMERIC DATA THROUGH A NUMERIC KEYBOARD

William N. Davis, II, Centerville, and Ruth E. Nash, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 17, 1984, Ser. No. 661,548
Int. Cl.[4] G06F 3/03
U.S. Cl. 364—900 1 Claim



1. A process for entering and editing character data being comprised of a predetermined number of characters using an entry terminal having a display and also having a keyboard having a predetermined number of character entry keys presented in a first array and a predetermined number of function keys, with said predetermined character entry keys being fewer in number than said predetermined number of characters; said process comprising the steps:

(a) presenting on said display more than one cluster of characters to be selected, with each said cluster containing fewer than said predetermined number of characters, and with at least some of said clusters of characters having a function symbol included therein, each said function symbol corresponding to an editing function for use in editing said character data; each said cluster of characters and said function symbol when included therein being presented on said display in a second array for selection;

(b) selecting, via a said function key, that one of said clusters of characters which contains the character to be entered via said terminal or which contains the function symbol desired for editing;

(c) actuating one of said character entry keys whose position in said first array bears a predetermined relationship to the position in said second array held by the character to be entered or the said function symbol desired to be entered for use in editing;

said first and second arrays corresponding to each other and said actuating step comprising selecting that one of said character entry keys in said first array which occupies the same position in said first array as the character or function symbol to be selected occupies in said second array;

said clusters of characters being aligned along a line on said display and said selecting step comprising sequentially making active on said display said clusters of characters and function symbols when included therein when moving in a first direction along said line until said cluster which contains the character or the function symbol to be entered is reached using a first said function key, and said selecting step also comprising sequentially making active on said display said clusters of characters and function symbols when included therein when moving in a second direction opposite to said first direction along said line until said cluster which contains the character or the function symbol to be entered is reached using a second said function key;

said editing comprising using a first one of said function symbols for moving a cursor to the left along a line of characters on said display; using a second one of said function symbols for moving said cursor to the right along said line of characters on said display; using a third one of said function symbols for deleting a said character shown on said line of characters on said display; using a fourth one of said function symbols for inserting a space in said

line of characters shown on said display; and using a fifth one of said function symbols for clearing a said line of characters shown on said display;

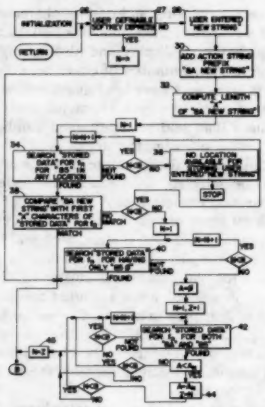
said presenting step comprising using at least first, second, third, fourth, fifth, and sixth said clusters of characters with ten characters namely zero through nine being included in said first cluster and with said first, second, third, fourth, and fifth said function symbols being included, respectively, in said second, third, fourth, fifth and sixth said clusters of characters.

4,680,729

METHOD AND APPARATUS FOR STORING AND UPDATING USER ENTERED COMMAND STRINGS FOR USE WITH OTHERWISE UNASSIGNED SOFTKEYS

Jonathan E. Steinhart, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 17, 1983, Ser. No. 505,561
Int. Cl.[4] G06F *15/00, 12/00, 3/00*
U.S. Cl. 364—900 **2 Claims**



1. A method of automatically assigning a user entered string to unassigned softkeys in a node on a computer terminal by automatically storing said string into a memory location corresponding to an unassigned softkey, the method comprising, in the order recited, the steps of:

a. automatically comparing the user entered string in response to entry of said string, against the data stored in the corresponding memory location for each unassigned softkey, and returning control to the user if a match is found;

b. automatically, in response to entry of said string, searching for a blank memory location that corresponds to a blank unassigned softkey, storing the user entered string in the corresponding memory location of that unassigned softkey, generating and storing a label to be displayed for that unassigned softkey, and returning control to the user if a match is found;

c. if a match is not found in either of steps a and b, automatically FIFO storing the user entered string into the corresponding memory locations of the unassigned softkeys having the earliest entered user entered string, generating and storing a label to be displayed for the newly stored string, and then returning control to the user;

d. generating an age character with each stored user entered string to identify its age since entry with respect to each of the other stored user entered strings, the string having the age character corresponding to the oldest entered string being considered the first entered string in step c;

step a. further includes the step of:

e. resetting the age character for the stored data where the match was found to be the youngest age and advancing the age character of each of the other stored user entered strings; and

steps b. and c. each further includes the step of:

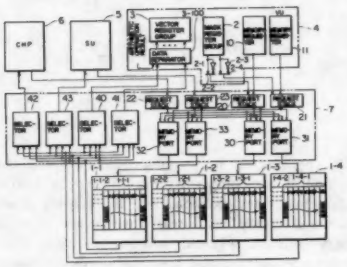
f. assigning the youngest age character to the user entered string being stored and advancing the age character of each of the other stored user strings.

4,680,730

STORAGE CONTROL APPARATUS

Koichiro Omoda, Sagamihara, and Shigeo Nagashima, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 629,042
Claims priority, application Japan, Jul. 8, 1983, 58-123245
Int. Cl.[4] G06F *12/06, 9/18*
U.S. Cl. 364—900 **15 Claims**



1. A storage control apparatus comprising:

a main storage device for storing at least one data block including a plurality of vector elements said main storage device having a plurality of memory banks and being configured so that then any one of said memory banks is activated for a read operation, the next access thereto is rejected until a vector element is read out with said read operation;

at least one vector register means connected to said main storage device, said at least one vector register means including a plurality of storage locations in which said a plurality of vector elements in said data block which are sequentially read out from said main storage device can be written;

mask register means for storing mask information which indicates for each said vector element whether or not each one of a plurality of vector elements sequentially read out from said main storage is required to be written in said vector register means; and

control means connected to said main storage device, said vector register means, and said mask register means for reading a plurality of vector elements and said mask information from said main storage and said mask register means, respectively, and for sequentially writing said plurality of vector elements and said mask information in said vector register means; said control means including means for inhibiting said vector register means from writing said data element in the corresponding one of said storage locations when said mask information corresponding to one of said vector elements indicates that the write operation is not required.

4,680,731

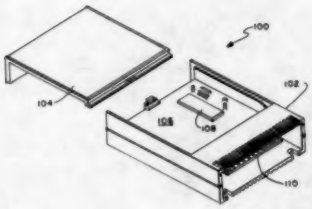
REPROGRAMMABLE CARTRIDGE MEMORY WITH BUILT-IN IDENTIFICATION CIRCUITRY AND PROGRAMMING METHOD

Hideki D. Izumi, and Paul J. Terrell, both of Saratoga, Calif., assignors to Romox Incorporated, Campbell, Calif.

Continuation of Ser. No. 476,383, Mar. 17, 1983, abandoned. This application May 19, 1986, Ser. No. 867,886

Int. Cl.[4] G06F *12/14*

U.S. Cl. 364—900 **7 Claims**



1. A plug-in memory cartridge for use in a computer system using programs stored in plug-in memory cartridges, said plug-in memory cartridge comprising:

a cartridge housing,

programmable semiconductor memory circuitry supported within said housing,

connector means for interconnecting said programmable memory circuitry to said computer system or to a cartridge programming system, said connector means including an address bus terminal means for providing addresses to said programmable semiconductor memory circuitry, an operation mode terminal means for providing read and write mode signals to said programmable semiconductor memory circuitry, and program voltage terminal means for providing a programming voltage to said programmable semiconductor memory circuitry when the cartridge is connected to said cartridge programming system and is in a write mode, and keying-locking circuitry within said cartridge housing, connected to said connector means and uniquely identifying said cartridge, said keying-locking circuitry being tested by said cartridge programming system prior to selectively enabling a programming operation of said programmable semiconductor memory circuitry, whereby only cartridges having said keyinglocking circuitry are programmed by said cartridge programming system.

4,680,732

INTERFACE CIRCUIT FOR CONNECTING PERIPHERAL EQUIPMENT TO A COMPUTER TERMINAL

Daniel A. DiCenzo, Bellbrook, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 23, 1982, Ser. No. 401,441

Int. Cl.[4] G06F *13/12*

U.S. Cl. 364—900 **7 Claims**

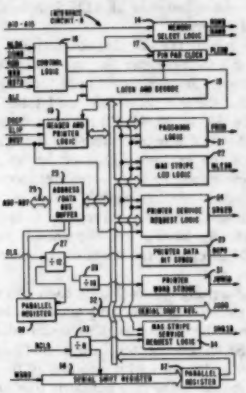
1. An interface controller, connected between peripheral equipment and a computer terminal, for selectively coupling plural pieces of peripheral equipment to the computer terminal, comprising:

a bidirectional bus connecting the interface controller to the terminal;

means for synchronizing the timing of the interface controller with the terminal, connected to the terminal and to elements within the interface controller;

means responsive to control signals from the terminal for selecting the peripheral equipment to be operated and the operational direction of said bidirectional bus;

firmware means directly addressable by the terminal for modifying the control signals, which are generated in the terminal and are used to control the means for selecting, to correspond with the peripheral equipment; and



means for receiving asynchronous serial data from selected asynchronous data generating type peripheral equipment and synchronously coupling the data in a parallel format to the terminal over said bidirectional bus.

4,680,733

DEVICE FOR SERIALIZING/DESERIALIZING BIT CONFIGURATIONS OF VARIABLE LENGTH

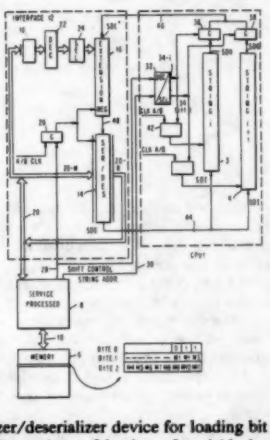
Guy G. Duforestel, La Gaude; Michel A. Lechaczynski, Nice; Clément Y. Poiraud, Cagnes/Mer, and Paul P. Viallon, Vence, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1984, Ser. No. 665,461

Claims priority, application European Pat. Off., Dec. 15, 1983, 83430040.2

Int. Cl.[4] G06F *3/00, 11/00;* G11C *19/00*

U.S. Cl. 364—900 **5 Claims**



1. A serializer/deserializer device for loading bit configurations comprising strings of latches of variable length $nk+r$, where n is the number of bits in a byte, k is the number of whole bytes in the string, and r is the number of residual bits, with r being smaller than n, and n being greater than 1, characterized said serializer/deserializer device in that it further comprises:

a serializer/deserializer (SERDES) shift register (14) having n latches that can be loaded in parallel,

an extension register (16) having (n−1) latches, said extension register and said SERDES shift register being connected in series;

selection means (18, 22, 24) for forming in said extension register a shift register the number of selected latches of which will vary dependent upon the length of the string of such that the number of selected latches is equal to (n−r),

means (36, 38, 46, 48, 44, 32) for interconnecting the latches of the SERDES register, those of the string of latches, and ones of the extension register latches selected by said selection means to form a register, such that bits can be circulatorily shifted serially from said SERDES shift register and said extension register to said string of latches;

means (6, 8, 20-W) for sequentially writing into the SERDES register the bytes to be loaded in the string of latches, and

clock and writing means (26, 40, 20-W) for selectively applying to the latches in said ring network clock pulses causing the bits in the ring network to be shifted, to load in parallel in the SERDES register the byte that includes the residual bits, in the low order bit positions of the byte cause n bits to be shifted in the ring network, load the k bytes in succession in the SERDES shift register, and cause n bits to be shifted after loading each byte.

4,680,734

SEMICONDUCTOR MEMORY DEVICE

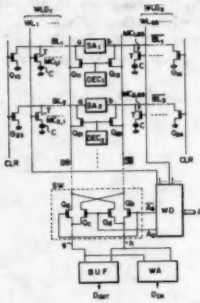
Fumio Baba, Kawasaki, and Yoshihiro Takemae, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 5, 1985, Ser. No. 762,531

Claims priority, application Japan, Aug. 11, 1984, 59-167276

Int. Cl.[4] G11C 7/00

U.S. Cl. 365—190 **12 Claims**



1. A semiconductor memory device operatively connected to receive a clear control signal and input data, and to generate output data, said memory device comprising:

a plurality of bit-line pairs;

a plurality of memory cells operatively connected to respective bit lines of said bit-line pairs;

a plurality of sense amplifiers, operatively connected between said bit-line pairs, each of said sense amplifiers corresponding to one of said bit-line pairs and each having a pair of complementary signal terminals operatively connected to respective bit lines of said corresponding bit-line pairs;

a pair of data buses, operatively connected to said bit-line pairs, for inputting and outputting data to and from a selected bit-line pair;

a data inverting circuit, operatively connected to said pair of data buses, for selectively inverting the input/output data such that the charging states of respective memory cells connected to said bit-line pairs become equal for the same input/output data and for outputting complementary signals; and

a clamp circuit, operatively connected to said bit-line pairs, for drawing the potentials of said bit-line pairs to a predetermined potential in response to the clear control signal applied when the contents of all of said memory cells are to be cleared.

4,680,735

SEMICONDUCTOR MEMORY DEVICE

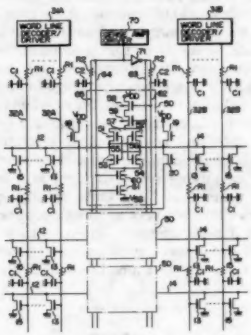
Junichi Miyamoto, and Jun-ichi Tsujimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1985, Ser. No. 759,142

Claims priority, application Japan, Sep. 21, 1984, 59-197924

Int. Cl.[4] G11C 7/02

U.S. Cl. 365—210 **8 Claims**



5. A semiconducting device comprising:

a plurality of bit line pairs, each pair of bit lines being respectively connected to a memory cell and to a dummy cell which are respectively selected by signals derived from word lines;

a plurality of means for sensing data by amplifying a potential difference between each pair of bit lines;

a first transistor having a gate connected between said data-sensing means and the power source for receiving at the gate, with a minimum time delay, a control signal to control the active state of each of said data-sensing means; and

a plurality of second transistors each having a gate connected between said data-sensing means and the power source respectively, said second transistor being connected in series to said first transistor, and for receiving, at the respective gates, said control signal with predetermined time delays, each of the predetermined time delays being substantially equal to the time delay of a signal on the word line connected to the memory cell associated with the data-sensing means.

4,680,736

METHOD FOR OPERATING A USER MEMORY DESIGNED A NON-VOLATILE WRITE-READ MEMORY, AND ARRANGEMENT FOR IMPLEMENTING THE METHOD

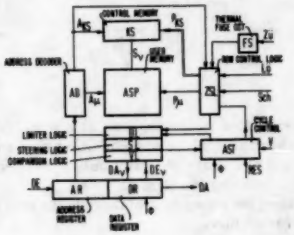
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,146

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315047

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—218 13 Claims



1. Method for operating a user memory which is designed as a non-volatile write-read memory comprising: storing, before each erase operation performed on the user memory, in a control memory a control bit in an empty memory location of the control memory, and inhibiting an erase operation on the user memory before having stored the control bit.

4,680,737

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

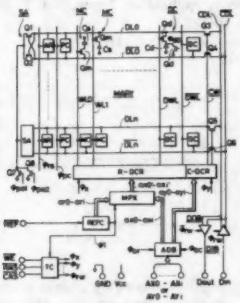
Kanji Oishi, Koganei, and Takashi Shinoda, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 727,922

Claims priority, application Japan, May 7, 1984, 59-89420

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—222 13 Claims



1. A semiconductor integrated circuit device which includes memory cells that need to be periodically refreshed, and which includes means for performing an inspection step which examines refresh characteristics and means for generating a signal for use in determining a refresh period, said semiconductor integrated circuit device comprising:

a timer circuit which generates output signals for determining a refresh timing of said memory cells and which comprises a program circuit which changes the period of said output signals according to said signal.

4,680,738

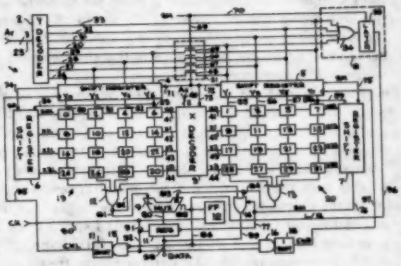
MEMORY WITH SEQUENTIAL MODE

Aloysius T. Tam, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 30, 1985, Ser. No. 760,712

Int. Cl.[4] G11C *8/00*

U.S. Cl. 365—239 11 Claims



1. A memory comprising:

a plurality of rows and columns of memory cells;

a column decoder;

a row decoder;

first means responsive to an output from each of said column and row decoders for addressing a first row and column of said memory cells; and

second means responsive to a single control signal having a predetermined logical level and a plurality of clock pulses for automatically addressing each of said columns and each of said rows in a predetermined sequence to access the contents of the remainder of said memory cells.

4,680,739

PROCESS FOR REMOVING ALL AMBIGUITY FROM THE MEASUREMENT BY DOPPLER EFFECT OF THE SPEED OF A MOVING TARGET

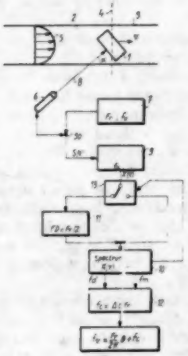
Olivier Lannuzel, Meaux, France, assignor to CGR Ultrasonic, Paris, France

Filed Apr. 4, 1985, Ser. No. 719,702

Claims priority, application France, Apr. 6, 1984, 84 05485

Int. Cl.[4] G01S *9/66*; A61B *5/02*; G01F *1/708*

U.S. Cl. 367—90 13 Claims



1. Process for removing all ambiguity from the measurement by Doppler effect of the speed of a target comprising the steps in which

a pulse vibrating at a sonic or acoustical frequency is emitted

in the direction of a target, periodically at a recurrence frequency;

the ultrasonic pulse retrodiffused by the target is received;

a complex demodulation of the signal received is carried out, by a signal of the same frequency as the emitting sonic or acoustical frequency;

the speed of the target is calculated by spectral analysis from the Doppler shift signal resulting from the demodulation, this shift being representative of the speed of the target, the determination ambiguity of the speed of the target being induced by the importance of this shift with respect to the half recurrence frequency,

wherein the speed calculated by spectral analysis is compared to a threshold, and when it overruns this threshold, said demodulated signal is modulated by a signal oscillating at a determination frequency so as to transpose, by a known value, the Doppler shift to be measured in a band smaller than the half of the recurrence frequency and;

wherein the calculation of the speed of the target comprises calculating by spectral analysis a shifted speed from this modulated signal and correcting said shifted speed by a width corresponding to the determination frequency in order to elaborate the true speed to be measured; and

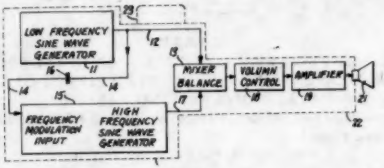
optionally performing one or more supplemental modulations and a corresponding corrections when the so shifted speeds overrun another threshold.

4,680,740

AUDIO AID FOR THE BLIND

Leonard A. Treptow, 51 Crescent Rd., #104, Greenbelt, Md. 20770

Filed Sep. 15, 1986, Ser. No. 906,888
Int. Cl.[4] G01S *15/88*
U.S. Cl. 367—101 **17 Claims**



1. A low cost, simplified, audio frequency signal locating system for use by the blind to identify objects in their path comprising:

means for generating a relatively high amplitude low audio frequency electric signal;

means for generating a high audio frequency electric signal;

frequency modulating means for frequency modulating the high audio frequency electric signal with the low audio frequency electric signal to derive a low frequency modulated high audio frequency electric signal;

mixer means having its input supplied directly with the high amplitude low audio frequency signal and with the low frequency modulated high audio frequency signal for deriving a high amplitude output low audio frequency carrier electric signal having the low frequency modulated high audio frequency electric signal superimposed thereon; and

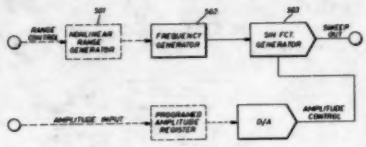
directional electro audio transducer means supplied with said high amplitude output low audio frequency carrier electric signal having the low audio frequency modulated high audio frequency electric signal superimposed thereon for deriving a directional audio beam comprised of the low audio frequency modulated high audio frequency wave superimposed on the low frequency high amplitude audio carrier usable by the blind to identify different characteristic objects and changes in physical features of the environs in which they are located.

4,680,741

METHOD AND APPARATUS FOR SEISMIC EXPLORATION USING NON-LINEAR SWEEPS

C. Ernest Wales, and Mitchell F. Peterson, both of Houston, Tex., assignors to Geosource, Inc., Houston, Tex.

Continuation of Ser. No. 310,828, Oct. 13, 1981. This application Sep. 29, 1986, Ser. No. 913,558
Int. Cl.[4] H04K *1/20*
U.S. Cl. 367—189 **2 Claims**



1. A method of generating one of a plurality of possible nonlinear sweep signals of predetermined time and shape and at the output of a sweep generator utilized to operate a seismic vibrator, comprising the steps of:

(a) dividing the sweep time of the output signal into a plurality of time intervals;

(b) calculating the rate of change of the frequency of the output sweep signal for each of said time intervals to realize said predetermined shape, said calculation in response to the range of the sweep, the sweep time, the starting frequency and the predetermined shape; and

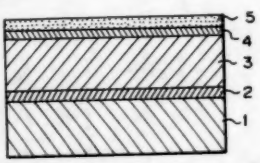
(c) Using each of said values calculated in step (b) to change the rate of change of frequency of the sweep signal for each of said preselected time intervals within said sweep time.

4,680,742

MAGNETO-OPTICAL RECORDING ELEMENT

Takashi Yamada, Hayato; Hisao Arimune, and Takashi Maeda, both of Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jul. 8, 1985, Ser. No. 752,927
Claims priority, application Japan, Jul. 7, 1984, 59-143079; May 31, 1985, 60-119342
Int. Cl.[4] G11B *7/24, 5/64*
U.S. Cl. 369—13 **9 Claims**



2. A magneto-optical recording element comprising a substrate, a dielectric layer containing silicon nitride, and a magnetic layer for magneto-optical recording having an axis of easy magnetization perpendicular to the film surface thereof, wherein the dielectric layer is a deposition film consisting essentially of a composition comprising silicon nitride and a refractive index-improving agent selected from the group consisting of single elements, oxides, nitrides, sulfides and silicides of elements of the groups IIIa, IVa, VIa, IIb, IIIb, IVb and VIb of the Periodic Table, said refractive index-improving agent being present in an amount of 0.5 to 8.0 mole% based on the composition, said dielectric layer having a refractive index greater than 2.15.

4,680,743

OPTICAL PARTS DRIVING MECHANISM IN OPTICAL INFORMATION READER

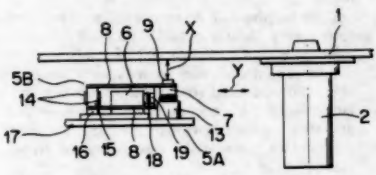
Yoshitsugu Araki, c/o Pioneer Electronic Corporation, Tokorozawa Factory, 2610, Hanazono 4 chome, Tokorozawa-shi, Saitama, 359, Japan

Filed Apr. 26, 1984, Ser. No. 604,027

Claims priority, application Japan, Apr. 28, 1983, 58-63037[U]

Int. Cl.[4] G11B 7/09

U.S. Cl. 369—44 6 Claims



1. An optical parts driving mechanism in an optical information reader reading information contained in an information recording medium in the form of a disc having disc driving mechanism axially extending in the center thereof, said optical parts driving mechanism comprising

a lens holder adapted to travel generally parallel to the disc and carrying an objective at a portion of said lens holder substantially closest to said disc driving mechanism, said objective having an axis being located substantially at an end of said optical parts driving mechanism located closest to said motor axis;

focus direction drive means mounted to said lens holder to drive said lens in generally perpendicular directions toward and away from said disc; and

track direction drive means mounted to said lens holder on an opposite side thereof with respect to said disc driving mechanism to drive said lens holder toward and away from the center of the disc, said track direction drive means including a track direction drive mechanism located substantially entirely at the opposite end of said optical parts driving mechanism, said track direction drive means thereby being mounted nonconcentrically with respect to said objective axis to thereby avoid placement of parts of said track direction drive mechanism between the objective axis and the motor axis to enable the objective to approach the center of said disc.

4,680,744

DISC PLAYER HAVING PICK-UP TILT SERVO SYSTEM COMBINED WITH DISC PRESENCE DETECTION CIRCUITS

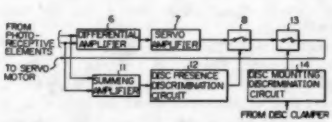
Hitoshi Kanamaru, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,191

Claims priority, application Japan, Jan. 30, 1984, 59-012144[U]

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—44 4 Claims



1. A recorded data playback apparatus for reproduction of data from a recording disc, comprising:

a pick-up including first light-emitting means for emitting a data sensing light beam for read-out of data from said recording disc;

a tilt servo system including a second light-emitting element mounted on said pick-up for emitting a tilt detection light beam towards said recording disc, at least two photo-receptive elements mounted on said pick-up to receive light reflected from said recording disc resulting from said second light-emitting element emission, a differential amplifier circuit connected to said photo-receptive elements for receiving output signals from said photo-receptive elements so as to produce an error signal varying in accordance with any difference in intensity between the output signals from said photo-receptive elements, and drive means for positioning said pick-up in accordance with said error signal so as to reduce the magnitude of said error signal;

disk presence discrimination means for producing a first output signal selectively indicating the presence and a second output signal indicating absence of said recording disc in accordance with the magnitude of at least one of the output signals from said photo-receptive elements; and

loop switch means coupled in said tilt servo system and controlled by said disc presence discrimination means, for thereby setting said tilt servo system in an operative state, in response to said first output signal and, for thereby setting said tilt servo system in an inoperative state in response to said second output signal.

4,680,745

OPTICAL DISK RECORDING APPARATUS

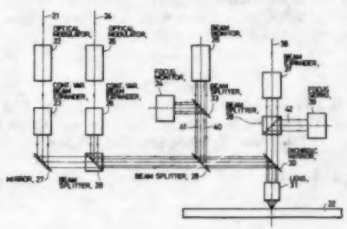
Minemasa Ota; Osamu Matsumoto, and Hiroyuki Ohira, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,267

Claims priority, application Japan, Feb. 13, 1984, 59-17480[U]

Int. Cl.[4] G11B 7/09, 7/125

U.S. Cl. 369—45 5 Claims



1. A recording apparatus in which light is applied to a recording medium to form pits and grooves therein, comprising:

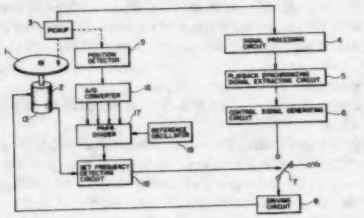
first varying means to form pits receiving a first light beam for varying the size of light spot formed on said recording medium by said first light beam and the recording power thereof; and

second varying means to form grooves receiving a second light beam of a different wavelength from that of said first light beam for varying the size of said second light beam and for varying the size of a light spot formed on said recording medium by said second light beam and the recording power thereof.

4,680,746
RECORDING DISC ROTARY DRIVE CONTROL APPARATUS

Hitoshi Senso, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 713,113
Claims priority, application Japan, Mar. 16, 1984, 59-51651
Int. Cl.[4] G11B *19/24*
U.S. Cl. 369—50 1 Claim

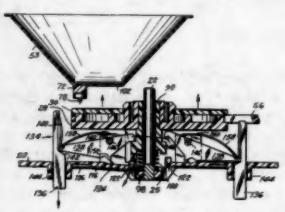


1. A recording disc rotary drive control apparatus wherein data is written on a recording disc with a substantially constant packing line density, said control apparatus comprising: position detecting means for detecting a distance covered by a pickup for reading said recording disc, the pickup being moved from a reference position in the radial direction thereof, and producing a position detecting signal representing the distance covered thereby; first pulse signal generating means for generating a position pulse signal with a period proportional to said position detecting signal; a motor for rotating said recording disc; second pulse signal generating means for generating a rotational pulse signal having a frequency proportional to the rate of rotation of said motor; switching signal generating means for counting pulses of said position pulse signal starting with the generation of said rotational pulse signal, and producing a switching signal for a period from when a pulse of said rotational pulse signal is produced until the counted value reaches a predetermined value; control signal generating means for generating a control signal for controlling the rate of rotation of said motor according to the output signal of said pickup; means for generating an accelerating signal for increasing the rate of rotation of said motor; driving means for driving said motor according to a driving signal; and switching means for applying said control signal to said motor as said driving signal when said switching signal is present and applying said accelerating signal to said motor as said driving signal while said switching signal is not present.

4,680,747
MULTI-MESSAGE PHONOGRAPH SYSTEM

Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840

Filed Nov. 7, 1985, Ser. No. 795,888
Int. Cl.[4] G11B *27/00, 3/78*
U.S. Cl. 369—65 36 Claims



1. A system for selecting one message of a plurality of messages of equally spaced concentric spiral grooves on a phonographic disc and for playing the selected message, each said selected message having a starting point on the periphery area of the disc and a termination point at the center area of the disc, comprising:

a housing having walls including a base wall forming a compartment,

a shaft having one end perpendicularly secured to said base wall and an opposite end positioned in said compartment,

speaker means mounted in said compartment,

arm means rotatably secured to said housing and movable in an arc on an arm plane perpendicular to said shaft, said arm means being operatively connected to said speaker means,

means for keeping said arm means aligned in said arm plane,

record means including said disc axially mounted a said opposite end of said shaft and rotatably movable perpendicular to said shaft, said record means being axially movable relative to said shaft between contact and non-contact positions, wherein said contact position the disc is in operative contact with said pickup means and in said non-contact position the disc is spaced from said arm means,

said record means including a cylindrical column axially mounted around said shaft, said column including a main column portion and a base column portion of greater diameter than said main column portion, said base column portion having a planar ring face transverse to said shaft extending outwardly relative to said shaft directed towards said main column portion,

said arm means being movable between said starting point and said termination point of the disc during rotation of said record means in said contact position, said arm means being positioned at a certain periphery position in preparation for contact with said starting point of said selected message,

drive means mounted in said compartment operatively connected to said record means for rotating said record means,

a source of power for energizing said drive means,

a plurality of selecting means equal in number to the number of messages on the disc, each of said plurality of selecting means being movable between inactivated and activated positions, any one of said plurality of selecting means adapted to be moved from said inactivated position to said activated position to initiate selection of said selected messages to be played wherein said record means is moved from said contact position to said non-contact position, each of said plurality of selecting means being aligned relative to starting points of associated messages and to said certain periphery position of said pickup means, said plurality of selecting means being a plurality of elements including push-buttons having opposed inner and outer button portions, said inner button portions being disposed in said housing and said outer button portions being spaced outwardly from said base wall, said push-buttons being movable generally parallel to said shaft for operation by a user at said outer button portion,

said plurality of elements further including rotatable arms having opposed inner and outer arm portions radially disposed around said shaft at equal intervals, said push-buttons forming shoulders in said compartment, said arm outer portions being positioned at said shoulders, said elements further including flexible strands joining said upper portion of said push-buttons and said arm outer portions,

said rotatable arms further including pressing fingers at said arm inner portions, wherein in said contact position of said record means said pressing fingers are axially spaced from said ring face of said column and are in pressing contact upon said ring face of said column during movement of said record means from said contact position to said non-contact position,

said base wall forming a plurality of radial slots aligned with said elements and also forming a plurality of holes spaced

radially outwardly from each of said slots, said holes being adapted to slidingly receive said push-buttons,

means associated with said selecting means upon said base wall for holding said record means in said non-contact position,

means for de-energizing said drive means upon said pickup means reaching said termination point of said message in said contact position of said record means during rotation of said record means,

means associated with said record means for releasing said means for holding and thereupon releasing said record means from said non-contact position upon rotation of said record means to said activated selected means of said plurality of selecting means,

first biasing means for pressing said record means from said non-contact position to said contact position upon release of said means for holding,

second biasing means for pressing said plurality of selecting means towards said inactivated positions,

wherein said record means is biased to said contact position with said starting point for said selected message being aligned with said certain position of said arm means.

4,680,748

RECORDED DISK PLAYBACK APPARATUS

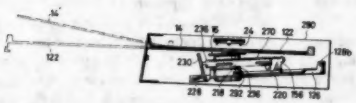
Koichi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1985, Ser. No. 763,958

Claims priority, application Japan, Dec. 19, 1984, 59-266331; Dec. 27, 1984, 59-273629; Jun. 20, 1985, 60-132914

Int. Cl.[4] G11B *19/10, 1/00, 17/04*

U.S. Cl. 369—77.1 **17 Claims**



1. A recorded disk reproducing apparatus for reproducing information memorized in a recorded disk by means of a pick-up head, comprising:

a main chassis housed in a main frame of the recorded disk reproducing apparatus;

a sub-chassis supported at one end thereof by said main chassis and pivotable around said one end of the sub-chassis;

a carriage attaching the pick-up head thereto and movable on said sub-chassis for moving the pick-up head in the radial direction of the recorded disk;

a turn table for putting the recorded disk thereon, said turn table being placed on the sub-chassis and rotated by a turn table motor;

a disk clamper rotatably disposed above the turn table at a fixed position with respect to said main chassis to hold the disk between the disk clamper and the turn table by the pivotal movement of the sub-chassis;

a first mechanism which moves the carriage and pivots said sub-chassis around said one end thereof;

driving means for driving said first mechanism.

4,680,749

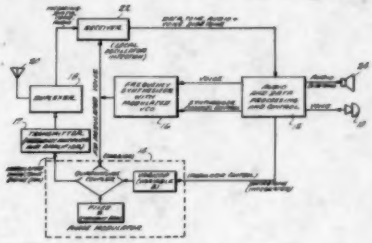
DUPLEX RADIO TRANSCEIVER HAVING IMPROVED DATA/TONE AND AUDIO MODULATION ARCHITECTURE

Arvid E. Englund; Stephen R. Wynn; Rodney A. Dolman, all of Lynchburg, Va.; Frederick J. Highton, Tucson, Ariz., and Rickey D. Harris, Forest, Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 15, 1985, Ser. No. 734,369

Int. Cl.[4] H04J *9/00*

U.S. Cl. 370—11 **27 Claims**



1. A duplex radio transceiver for transmitting and receiving voice and data signals comprising:

an r.f. receiver having a local oscillator injection signal input port and a detected output port;

a signal synthesizer providing an FM carrier/injection signal which is frequency modulated by said voice signals;

said receiver local oscillator injection signal port being connected to receive said FM carrier/injection signal;

a phase modulator connected to also receive said FM carrier/injection signal and to phase modulate such signal by said data signals thereby providing a complex FM output signal; and

an r.f. transmitter connected to transmit said complex FM output signals.

4,680,750

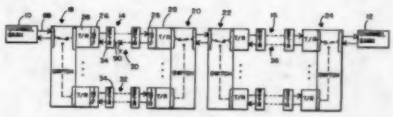
UNIVERSAL HIGH-SPEED SPAN LINE SWITCH

Clifford A. Davidow, Reno, Nev., assignor to Lynch Communication Systems, Inc., Reno, Nev.

Filed Oct. 1, 1984, Ser. No. 656,550

Int. Cl.[4] H04J *3/02;* **H04B** *3/46*

U.S. Cl. 370—16 **17 Claims**



1. In a PCM telephone span line switch which is arranged to automatically transfer data signals from a span contaiing a failed span line to a spare span, and which at times during its operation substitutes internally generated code and keep-alive signals for one or more of the data signals normally transmitted through said switch over a group of resonant span lines from a channel bank, the phase of said internally generated signals being independent of the phase of said data signals, the method of preventing span line disturbances as a result of the operation of said switch, comprising the steps of:

(a) interposing, between each transmission from said switch of signals in one of said phases and a transmission of signals in the other of said phases, a transmission of a signal consisting of a number of consecutive zeroes sufficient to prevent the occurrence in said span of signal errors sufficient to trigger a transfer operation in another span line

switch downstream from said span, but insufficient to prevent its interpretation of said interposed signal as a loss-of-signal condition.

4,680,751

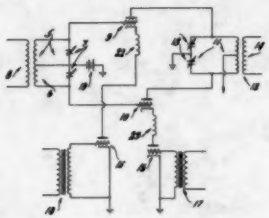
POLARIZED CARRIER MODULATION

James W. Bryan, 4910 Mud La., Louisville, Ky. 40229

Continuation of Ser. No. 810,271, Jun. 27, 1977, abandoned. This application Nov. 2, 1979, Ser. No. 90,648

Int. Cl.[4] A04J *3/02*

U.S. Cl. 370—78 **1 Claim**



1. A polarity multiplexer comprising: a push-pull amplifier comprising two amplifying means each amplifying a different exclusive portion of a carrier signal applied to its input, two modulation amplifiers receiving respective different input signals and each providing a respective modulation output signal, an inductor coupling each modulation output signal in series with a respective amplifying means to thereby modulate the output of each amplifying means in accordance with the modulation output signal, whereby different input signals are modulated on respective portions of the carrier having different polarities.

4,680,752

TIME SWITCH IN A TIME DIVISION SWITCHING NETWORK

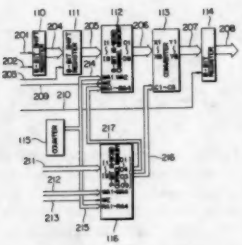
Tetsuo Takemura, Kamakura, and Shinobu Gohara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,392

Claims priority, application Japan, May 24, 1983, 58-90030; May 24, 1983, 58-90031

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—63 **17 Claims**



1. A time switch comprising:

memory means including a channel memory for writing bits contained in each time slot of an incoming multiplexed highway into said channel memory according to a fixed address designation corresponding to the time slot of the incoming multiplexed highway and for reading said bits out of said channel memory according to a variable address designation corresponding to a time slot of an outgoing multiplexed highway;

converter means for covnerting the bits read out of said channel memory to a universal signal, so that a bit stream in the incoming multiplex highway is rate-adapted to a predetermined bit rate of the time slot of the outgoing multiplex highway, in accordance with a conversion mode designation; and

a control memory for supplying said variable address designation to said memory means and said conversion mode designation to said converter means in synchronism with each other.

4,680,753

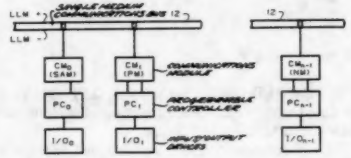
SYSTEM AND METHOD FOR CONTROLLING NETWORK BUS COMMUNICATIONS FOR INPUT-OUTPUT INTERLOCKING INFORMATION AMONG DISTRIBUTED PROGRAMMABLE CONTROLLERS

Temple L. Fulton, Elizabethon, and William O. Perkins, Johnson City, both of Tenn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 3, 1985, Ser. No. 719,174

Int. Cl.[4] H04J *3/02, 3/16*

U.S. Cl. 370—85 **21 Claims**

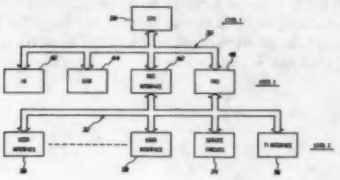


1. In a system for controlling a process using a network of distributed programmable controllers coupled to a communications bus each adapted to receive input information relating to the process, to determine appropriate output information based on the input information and to generate output signals to selected output devices to control the process, apparatus for controlling communications of tightly coupled information among the controllers comprising communication module means coupled between each programmable controller and the communications bus, each of the communication module means adapted to broadcast and receive data over the communications bus, each of the module means adapted to operate as an active monitor exercising exclusive control over broadcasting activity on the network granting in turn time slots to each other module means on the network enabling said each other module means to broadcast data during its respective time slot and each of the module means also being adapted to operate as a non-monitor adapted to broadcast data to all other module means on the network only when enabled by an active monitor, each of the communications module means being adapted to operate as a passive monitor which in addition to broadcasting data to all other module means in the network when enabled by the active monitor also continuously monitors broadcasting activity on the network and after a selected time interval of no broadcasting activity becomes an active monitor exercising exclusive control over broadcasting activity on the network, the system including timing means to provide an indication of the expiry of the selected time interval, means to select any one of the module means as a user selected active monitor and means to assign any selected one of the communication module means other than the active monitor as a passive monitor.

4,680,754
MULTI-FUNCTION BUS

William A. Fechalos, Naperville, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1985, Ser. No. 740,372
Int. Cl.[4] H04J 3/02, 3/12
U.S. Cl. 370—85 1 Claim



1. A multi-function bus for use with a central processor system, user devices having user interfaces and a host switching interface unit, said multi-function bus comprising:

a first pre-determined number of transmit and receive lines connecting a central processing system, the user interfaces and the host switching interface unit;

a second pre-determined number of channels on each of said transmit and receive lines, said channels grouped on said multi-function bus in a frame, each frame having a predetermined number of bits and each bit having a predetermined bit period, each of such channels having end bits and appearing serially within said frame, said frame also including a frame synchronization bit;

means for transferring information to and from said host switching interface in a serial mode on said multi-function bus; and

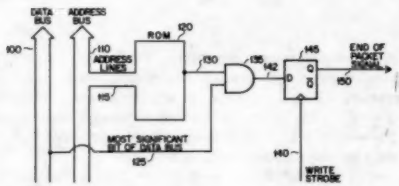
means for transferring information between said central processsding system and said user interfaces in a a parallel mode on said multi-function bus;

said multi-function bus operated in a serial mode, and in a parallel mode, by said first and second means for transferring information by utilizing one-half of each bit period for serially transmission and the other one-half bit period for parallel transmission.

4,680,755
REAL-TIME END OF PACKET SIGNAL GENERATOR

Stephen P. Reames, Colorado Springs, Colo., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1985, Ser. No. 798,054
Int. Cl.[4] H04J 3/02, 3/24, 3/12
U.S. Cl. 370—85 2 Claims



1. An apparatus for generating an end-of-packet signal, said end-of-packet signal indicating, in real time, the occurrence, of the tail end of a local area network packet, said packet being transmitted on a local area network, said apparatus comprising:

a local area network coprocessor, said coprocessor being resident in a host device, said host device having memory and a memory address bus, said coprocessor being adapted to receive local area network packets in bit serial form from a local area network transmission medium, to store said packets in host device memory in a uniform structured format, to create and maintain an associated status word for each stored packet, the most significant bit of each said status word being set to true when the end of said packet is received, and to generate a write-strobe-signal whenever said coprocessor is in a write-to-memory cycle;

a memory-address-comparison means for comparing the address in host device memory to which said coprocessor is writing with addresses of said status words, and for generating an output signal when the address in host device memory being written to by said coprocessor is the address of one of said status words;

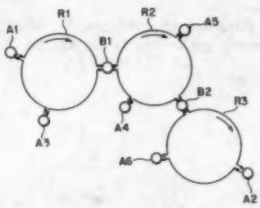
an electronic logic gate having as inputs said output signal of said memory-address-comparison means and the most significant data-bit of data words written to said memory of said host device, said electronic logic gate producing a true output when both of said inputs are true; and

a clocked flip-flop circuit, having as input the output of said electronic logic gate, and having as clock signal the write-strobe-signal of said coprocessor, said clocked flip-flop circuit producing as output said end-of-packet signal.

4,680,756
MULTI-NETWORK SYSTEM

Norihiko Sugimoto, Katsuta; Shunji Inada, Hitachi, and Nagatoshi Usami, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,509
Claims priority, application Japan, Mar. 18, 1985, 60-52379
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—88 3 Claims



1. Multi-network system for transmitting data among a plurality of stations, each of which is connected to one of transmission lines, a plurality of said transmission lines being connected with each other through bridge stations, comprising:

a plurality of stations, each of which is connected to one of the transmission lines, sends, receives and relays data consisting of a means for forming the own address of the station including the number of transmission line to which the station is connected, a means for forming the destination address including the number of transmission line, to which the destination station which should receive data sent by the former station is connected, and a means for sending the data having the destination address and the own address of the former station in the form of address information in the transmitted data frame at the moment of sending the data; and

at least one bridge station connected with two different transmission lines, which sends, receives and relays data and relays data between the different transmission lines, consisting of a memory means storing data sent by the own station and data to be relayed between the different transmission lines, a means for judging at the moment of the reception of the data whether the number of transmission line contained in the address information of the received data frame is different from the number of trans-

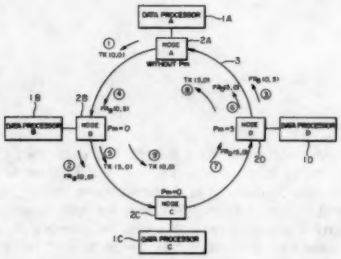
mission line, from which the data have been received, or not and when they are different, storing received data containing the address information in said memory means; a means for setting a flag representing the relay between the transmission lines in connection with the received data stored in said memory means and when data sent by the own station are stored in said memory means, a flag indicating that they are not data relayed between different transmission lines in connection with said data; a means for forming the own address including the number of transmission line for each of the transmission lines with which the own station is connected; a means for forming the destination address including the number of transmission line, with which the destination station which should receive the data sent by the own station is connected; and a transmission means for judging at the moment of sending data whether the flag in connection with the sent data stored in said memory means represents a relay between the different transmission lines or not; when the flag represents a relay between the different transmission lines, sending the relevant data in the form of a data frame, which are the received data, including the address information; and when the flag doesn't represent any relay between the different transmission lines, sending the relevant data in the form of a data frame having said destination address and the own address of the station as the address information.

4,680,757

METHOD OF AND APPARATUS FOR STORING PRIORITY LEVELS IN TOKEN-RING NETWORK SYSTEM

Toshiyuki Murakami, Hitachi; Norihiko Sugimoto, Katsuta, and Naoki Ogawa, Omura, all of Japan, assignors to Hitachi, Ltd. and Process Computer Engineering, Inc. Hitachi, both of Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,311
Claims priority, application Japan, Apr. 15, 1985, 60-78291
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—89 **9 Claims**



1. A method of storing priority levels in a token-ring network system having a ring transmission link and a plurality of nodes accommodated in the ring transmission link, each node being capable of transmitting/receiving a token and a frame, wherein each node can reserve in a frame being passed through said transmission link a priority level for a frame that the node of its own requests for transmission and can transmit the frame of its own requested for transmission when acquiring a right to transmission by receiving a token, said method comprising, for storing priority levels at each node, the steps of:

reading, upon receipt of the frame transmitted from its own node, values of current and reservation priority levels;

compairing the read values of both the priority levels and storing, when the value of reservation level is higher than the value of current priority level, said value of reservation level in storing means having the same number of bits as that of grades of the priority level with bit positions respectively corresponding to values of the priority level, by setting to one state a value at a bit position of said storing means corresponding to at least said value of reservation level;

reading, upon receipt of a token, a value of current priority level in said token; and

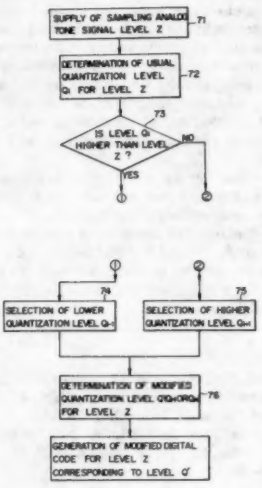
comparing the read value of priority level in said token with the highest value of priority levels stored in said storing means and upon coincidence, resetting to the other state a value at a bit position of said storing means corresponding to at least said highest value.

4,680,758

SWITCHING SYSTEM HAVING TONE TRUNK

Masayuki Kumazaki, Yokohama; Toshio Shimoe, Kawasaki, and Koso Murakami, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1986, Ser. No. 845,587
Claims priority, application Japan, Mar. 30, 1985, 60-64993
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.2 **8 Claims**


SUPPLY OF SAMPLING ANALOG TONE SIGNAL LEVEL Z
71
DETERMINATION OF USUAL QUANTIZATION LEVEL Q0 FOR LEVEL Z
72
73
IS LEVEL Q0 HIGHER THAN LEVEL Z ?
NO
YES
74
75
SELECTION OF LOWER QUANTIZATION LEVEL Q-1
SELECTION OF HIGHER QUANTIZATION LEVEL Q+1
DETERMINATION OF MODIFIED QUANTIZATION LEVEL QQ=ORQ= FOR LEVEL Z
76
GENERATION OF MODIFIED DIGITAL CODE FOR LEVEL Z CORRESPONDING TO LEVEL Q'

1. A switching system comprising:

a plurality of telephone sets for each subscriber;

a network which is operative to achieve a switching operation of digital signals to be communicated between the plurality of telephone sets by way of respective line circuits having a coder and decoder; and

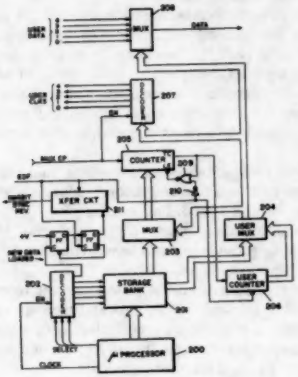
a tone trunk which is operative to store, in a digital memory thereof, at least one predetermined digital tone signal, in the form of digital codes, for supplying, by way of the network and said decoder, the corresponding analog tone signal to the telephone sets, in which the digital codes are coded in such a way that the decoded analog tone signal is accompanied by a quantizing noise, created during a conversion from the analog tone signal to the digital tone signal, which quantizing noise is substantially the same as a white noise.

4,680,759

STANDARD/PROPORTIONAL MULTIPLEXER

Larry J. Miller, South Jordan; Clifford T. Johnson, Sandy, and Glen D. Rattlingourd, Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Oct. 15, 1984, Ser. No. 660,742
Int. Cl.[4] H04J 3/04, 3/22
U.S. Cl. 370—112 **15 Claims**



1. A multiplexer system comprising,

control means,

register means connected to receive and store signals from said control means,

counter means connected to receive signals from said register means and to supply address signals to said control means thereby to select the signal produced by said control means,

user data signal supplying means for supplying data signals from user means,

multiplexer means connected to said register means to receive coded signals therefrom in order to select which data signals are passed through said multiplexer means from said user data signal supplying means,

clock signal supplying means,

demultiplexer means connected to said register means to receive said coded signals in order to select which clock signals are generated by said demultiplexer means,

data supply means connected to supply further data signals to said multiplexer means,

first shift register means for operating on said further data signals in parallel or serial fashion and supplying said further data signals to said multiplexer means, and

data handling means for operating upon said further data signals to supply said further data signals to said first shift register means directly or in inverse sequence.

4,680,760

ACCELERATED TEST APPARATUS AND SUPPORT LOGIC FOR A CONTENT ADDRESSABLE MEMORY

Grady L. Giles; Jesse R. Wilson, and Terry V. Hulett, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1985, Ser. No. 762,656
Int. Cl.[4] G06F 1/00
U.S. Cl. 371—21 **5 Claims**

1. A content addressable memory (CAM) array comprising:

n entries of m bits per entry;

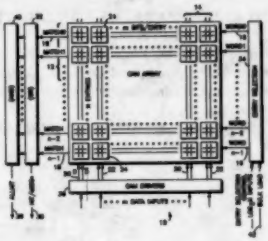
a word line and a match line for each entry, wherein the match line has a state;

a bit line and a complementary bit line for each bit;

n×m bit cells each having a word line, a match line a bit line and a complementary bit line, each bit cell further comprising a memory element and an exclusive OR comparator of the cell's bit value with a value presented on the bit lines;

a HIT/MISS* means for ORing of the states of the n match lines, the HIT/MISS* means having an output;

wherein the improvement comprises an ALLHIT means



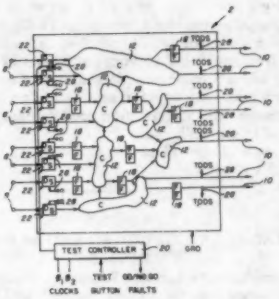
separate from the HIT/MISS* means for monitoring the states of the n match lines, performing an operation with the states from the n match lines and providing an output signal giving the result of the operation, wherein the ALLHIT means is selected from the group of means consisting of an AND gate and a scan path.

4,680,761

SELF DIAGNOSTIC CYCLIC ANALYSIS TESTING SYSTEM (CATS) FOR LSI/VLSI

Donald C. Burkness, 1709 Glenkarney Pl., Silver Spring, Md. 20902

Filed Jan. 30, 1986, Ser. No. 824,223
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—25 **16 Claims**



1. A method for testing an integrated circuit including a plurality of inputs, a plurality of outputs, and a plurality of logic devices connected between the inputs and outputs, each of the logic devices including a plurality of logic gates and memory elements, comprising the steps of

(a) isolating a first logic device to be tested from the remaining logic devices by turning off all external circuit inputs;

(b) reconfiguring said first logic device to include all logic gates and memory elements to simulate a non-linear binary sequence generator;

(c) presetting the memory elements of said first logic device to a known start setting, respectively;

(d) clocking said first logic device for a given number of steps to define a testing cycle to operate the logic gates and memory elements as the non-linear binary sequence generator, the memory elements achieving a known setting under normal operating conditions and a different setting under fault conditions;

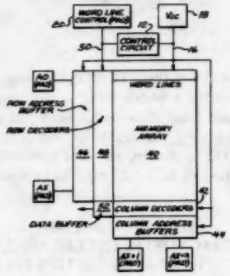
(e) comparing the settings of the memory elements after the testing cycle with the known setting; and
(f) indicating a fault condition when the settings differ from the known setting.

4,680,762

METHOD AND APPARATUS FOR LOCATING SOFT CELLS IN A RAM

Kim C. Hardee, Clermont, Fla.; Anwar U. Khan, Santa Clara, Calif.; Steven D. McEuen, and David J. Wicker, Jr., both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Del.

Filed Oct. 17, 1985, Ser. No. 788,443
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—28 **19 Claims**



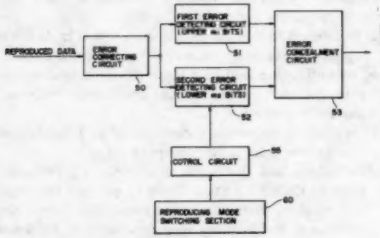
1. In a memory cell array utilizing a power supply voltage (VCC), and having word lines for enabling the cells in a row of said array, a method for locating a potentially defective cell including the steps of:
coupling a probe tester to a VCC pad and a test pad which is coupled to the word line for said cell;
operating a control circuit to isolate the word line for said cell from said VCC pad but not from said test pad;
storing a first predetermined value in said memory cell;
applying a varying signal to said word line for said cell;
determining whether said first predetermined value is still stored in said cell; and
operating said control circuit to couple said word lines to said VCC pad.

4,680,763

DIGITAL DATA RECORDING AND REPRODUCING DEVICE

Tetsuro Suma; Takao Abe, and Tetsuo Ogawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,443
Claims priority, application Japan, Sep. 8, 1983, 58-165677
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **4 Claims**



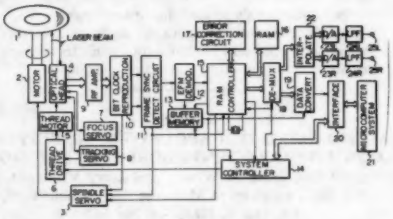
1. A digital data recording and reproducing device for recording and reproducing a recording data signal consisting of data having a code word length of M bits comprising:
first detection code calculating means for calculating at least one first redundant bit representing a first detection code for detecting an error of data of the m_1 most significant bits of the code words of M bits during reproduction and first detection code association means for associating each said first redundant bit as the first detection code with said m_1 most significant bits;
second detection code calculating means for calculating at least one second redundant bit representing a second detection code for detecting an error of data of the m_2 least significant bits of the code words of M bits during reproduction and second detection code association means for associating each said second redundant bit as the second detection code with said m_2 least significant bits;
signal recording means for recording said recording data signal with said first and second redundant bits associated therewith on a recording medium;
signal reproducing means for reproducing the recorded signal to provide a reproduced data signal from said recording medium; and
signal processing means for processing said reproduced data signal in response to said first and second redundant bits, said signal processing means including first error detecting means for producing a first detection signal by detecting an error of said m_1 most significant bits in response to said first redundant bit of said reproduced data signal, second error detecting means for producing a second detection signal by detecting an error of said m_2 least significant bits in response to said second redundant bit of said reproduced data signal, and concealing means for concealing errors in said reproduced data signal if either said first or second detection signal is provided.

4,680,764

METHOD AND APPARATUS FOR TRANSMITTING DIGITAL DATA

Tadao Suzuki; Yoichiro Sako, both of Tokyo; Shunske Furukawa; Tsuneo Furuya, both of Kanagawa, all of Japan, and Constant P. M. J. Baggen, Eindhoven, Netherlands, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,892
Claims priority, application Japan, Mar. 24, 1984, 59-57595; Mar. 24, 1984, 59-57596
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—40 **16 Claims**



1. An information transmission method with error correction for user words formed in the information, comprising the steps of:
dividing each user word into first and second multiple bit user symbols of equal length;
introducing a first plurality of data symbols into a first Reed-Solomon encoder for adding thereto respective ones of a first series of parity symbols, in which said data symbols are generated from said first and second user symbols;

interleaving output symbols of the first encoder by means of respective different delay times;

introducing a second plurality of data symbols in a second Reed-Solomon encoder for adding thereto respective ones of a second series of parity symbols, to produce a third plurality of code symbols;

modulating said third plurality of code symbols into channel symbols for introduction into a record medium for subsequent decoding therefrom;

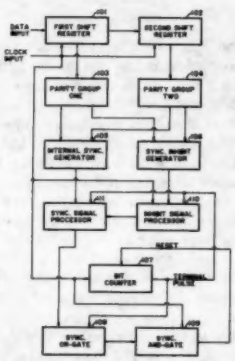
wherein said data symbols are generated in a sector-wise fashion by adding to said user symbols a third series of parity symbols in a third Reed-Solomon encoder; and

wherein each sector after encoding consists of a plurality of data symbols equal in number to the entire plurality of said first plurality of data symbols.

4,680,765
AUTOSYNC CIRCUIT FOR ERROR CORRECTING BLOCK DECODERS

George D. Doland, 1602 Redway La., Houston, Tex. 77062

Filed Jul. 26, 1985, Ser. No. 759,252
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—42 3 Claims



1. An autosync circuit for synchronizing decoders for digital communications which use block codes, and which does not require a sync pattern in the digital data signal but uses a plurality of parity bits in each digital word, said apparatus comprising,

a plurality of word length shift registers connected in series into which the serial digital data signal is shifted using an external clock from the data source and said shift registers having an output from each stage of the shift registers,

a means for checking the parity of the bit group for each parity bit in the digital word in the first of said shift registers, using the outputs from each stage of said first shift register, and a means for combining the output of said parity checking means so as to produce a single signal output signifying that the parity is true for all parity bit groups of said digital word in the first shift register,

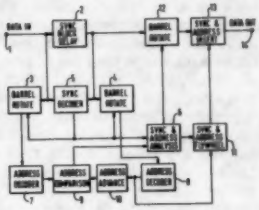
means for checking the parity of each bit group for each parity bit in each of the other digital words in each of the plurality of said shift registers with means for combining the outputs of said parity checking means so as to produce a single output for each digital word signifying that the parity is true for all parity bit groups of the digital word.

a means for combining the outputs of said parity checking means for each of the plurality of digital words in the said plurality of shift registers, said signal signifying that the parity is true for all parity groups of the said digital words, and said signal being the synchronizing signal.

4,680,766
DECODING DIGITAL DATA

James H. Wilkinson, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,287
Claims priority, application United Kingdom, May 16, 1984, 8412500
Int. Cl.[4] H04N *5/93*
U.S. Cl. 371—47 9 Claims



4. Apparatus for decoding incoming digital data provided at a high data rate from a digital tape video recorder or the like and which includes respective synchronizing codes and address codes associated with successive data blocks, the address codes comprising respective data block addresses which increase by one from data block to data block, the apparatus comprising:

a synchronizing code decoder for checking the incoming digital data to locate the positions of said synchronizing code;

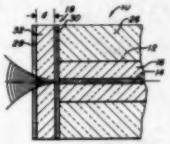
an address comparison circuit for checking successive address codes to ascertain if said block address increases by one from one address code to the next; and

means operative if said block address increases by one from one address code to the next for aligning said incoming data using synchronizing codes for subsequent decoding of said data blocks, to insure correct and rapid identification of the incoming synchronizing and address codes while minimizing redundant bits.

4,680,767
OPTICAL FIBER LASER

Farhad Hakimi, Boston; Hong Po, Sherborn, and Elias Snitzer, Wellesley, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 1, 1985, Ser. No. 750,594
Int. Cl.[4] H01S *3/30*
U.S. Cl. 372—6 14 Claims



1. An optical fiber laser comprising:

a gain cavity including a single mode optical fiber of given length having a core with a given index of refraction and a cladding surrounding said core and having an index of refraction lower than that of said core, said core comprising a host glass having incorporated therein a laser gain material with a fluorescence spectrum having at least one broadband region in which there is at least one peak emission line;

filter means optically coupled to one end of said gain cavity

and reflective to radiation emitted from said gain material over a predetermined wavelength interval about said peak emission line to provide feedback in said gain cavity;

an etalon filter section butt coupled to the remaining end of said gain cavity optical fiber, said etalon filter section comprising a pair of filters spaced apart in parallel by a predetermined length of material transparent to any radiation emitted from by said gain cavity, one of said parallel filters being in direct physical contact with said core and perpendicular to the longitudinal axis of said core with the other of said parallel filters serving as the emitting end of said laser, said predetermined length of said transparent material in combination with the reflection characteristics of said pair of parallel filters being such that etalon filter section operates as a Fabry-Perot resonator in reflection with a periodic reflectivity characteristic having a peak reflectivity centered at said peak emission line of said gain material and gradually dropping to no reflectivity on either side of said peak reflectivity, said etalon filter section and the resonant characteristics of said gain cavity being structured and arranged with respect to one another to jointly operate to enhance laser action at said peak emission line and to preclude it beyond a wavelength interval centered about said peak emission line, said predetermined length of said transparent material being such that said etalon filter section is no longer than the distance over which the wave train energy from said fiber core remains substantially planar so that said etalon filter section is inside the divergent region from said fiber core to enhance feedback in said gain cavity; and

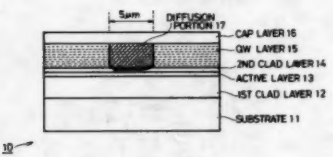
means for pumping energy into said gain cavity to raise the interval energy level of said gain material such that only a small part of the ion population thereof, corresponding to a predetermined bandwidth about said peak emission line, is raised above laser threshold for said gain material so that said laser emits radiation only over narrow lines over a narrow wavelength interval centered about said peak emission line.

4,680,768

SEMICONDUCTOR LASER WITH A QUANTUM WELL LAYER INCLUDING A DISORDERED REGION

Katsumi Yagi, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jul. 15, 1985, Ser. No. 755,079
Claims priority, application Japan, Jul. 19, 1984, 59-149954
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 **18 Claims**



1. In a semiconductor laser:

an active layer substantially oscillating laser beams;

a first clad layer provided in contact with one principal surface of said active layer and being larger in band gap energy and smaller in optical refractive index than said active layer;

a second clad layer provided in contact with the other principal surface of said active layer and being larger in band gap energy and smaller in optical refractive index than said active layer; and

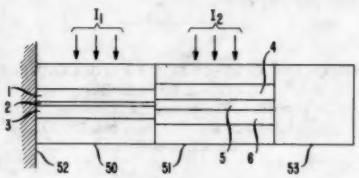
a quantum well (QW) layer contiguous to a surface of one of said first and second clad layers, the surface of said one clad layer contiguous to said QW layer being opposite the surface of said one clad layer which is in contact with said active layer, said QW layer being in quantum well structure and including a disordered Portion spaced from said active layer and a non-disordered portion.

4,680,769

BROADBAND LASER AMPLIFIER STRUCTURE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 21, 1984, Ser. No. 673,584
Int. Cl.[4] H01S 3/098, 3/10
U.S. Cl. 372—50 **25 Claims**



1. An injection laser which comprises first and second active laser regions having first and second ends, wherein the first and second active laser regions are disposed against one another at the second ends thereof,

first and second means for injection pumping the first and second active laser region to produce gain over a wavelength region in each the wavelength at which the gain of the first active laser region is a maximum being different than the wavelength at which the gain of the second active laser region is a maximum, the wavelength regions overlapping to produce a combined gain distribution over a broader wavelength region than the wavelength regions of either the first or second active laser regions alone,

a partial reflector of laser radiation generated at the first end of the first active laser region, and

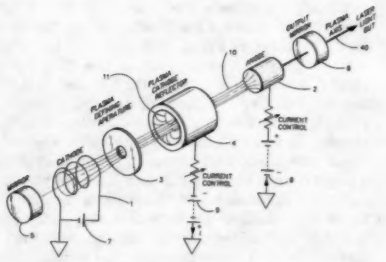
a wavelength selective partial reflector of the laser radiation disposed at the first end of the second active laser region to form a laser cavity between the partial reflector and the wavelength selective partial reflector.

4,680,770

DUAL BEAM GAS ION LASER

William E. Bell, Jerome, Ariz., and George J. Collins, Fort Collins, Colo., assignors to Lasertechnics, Inc., Albuquerque, N. Mex.

Filed Jan. 21, 1986, Ser. No. 821,156
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—99 **40 Claims**



1. A dual beam gas ion laser comprising:

a vacuum enclosure having a longitudinal optical axis that is defined by a resonant cavity having a mirror at each end thereof, one or both of which is employed to extract power from the laser;

a thermionic cathode having an axial opening therein and being positioned within the vacuum enclosure such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure for allowing an unobstructed optical path between the two mirrors;

an anode having an axial opening therein and being positioned within the vacuum enclosure in spaced apart relationship to the thermionic cathode and such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure for allowing an unobstructed optical path between the two mirrors;

at least two plasma defining aperature means, each having an aperature therein and each being positioned within the vacuum enclosure such that its aperature is in alignment with the longitudinal optical axis of the vacuum enclosure, one of said plasma defining aperature means being positioned proximate to the thermionic cathode and the other of said plasma defining aperature means being positioned proximate to the anode such that both of said plasma defining aperature means are positioned between the thermionic cathode and the anode;

a photocathode reflector having an axial opening therein and having a geometric inner surface, the photocathode reflector being positioned within the vacuum enclosure between the aperatures in the plasma defining aperature means such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure and such that the geometric focus of the geometric inner surface of the photocathode reflector lies substantially on the longitudinal optical axis of the vacuum enclosure;

first power supply means electrically connected for heating the thermionic cathode to produce thermionic emission of electrons therefrom;

second power supply means electrically connected between the thermionic cathode and the anode for accelerating the electrons thermionically emitted by the thermionic cathode to form a longitudinal plasma arc along a portion of the longitudinal optical axis between the anode and the thermionic cathode, the longitudinal plasma arc being generally in alignment with the aperatures of the plasma defining aperature means;

third power supply means electrically connected to the photocathode reflector to accelerate electrons produced by a combination of photon and ion bombardment of the geometric inner surface of the photocathode reflector to form a glow discharge electron beam that is transverse to said longitudinal plasma arc; and

gas port means in the vacuum enclosure for permitting evacuation of the vacuum enclosure and for admitting one or more gases into the vacuum enclosure.

4,680,771

MIRROR ADJUSTMENT DEVICE IN LASER OSCILLATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., La Mirada, Calif.

Filed Dec. 31, 1985, Ser. No. 814,981

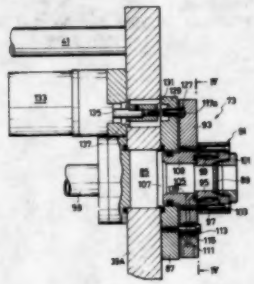
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **9 Claims**

1. A mirror adjustment device for a laser oscillator comprising:

a mirror holder for installing one of an output and rear laser mirror, said mirror holder supported on a support plate, said mirror holder being mounted on said support plate for free rotation about a first axis which is parallel to the X axis and a second axis which is parallel to the Y axis, and an adjustment motor connected with said mirror holder



for selective, slight rotation of said mirror holder about said first axis and said second axis.

4,680,772

DIGITAL SIGNAL REPEATER INCLUDING MEANS FOR CONTROLLING A TRANSMITTER

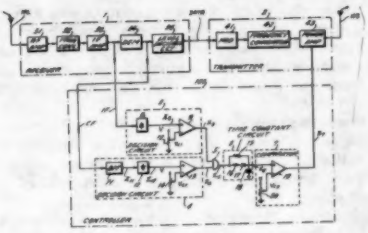
Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 16, 1985, Ser. No. 766,262

Claims priority, application Japan, Aug. 25, 1984, 59-175844

Int. Cl.[4] H04B *7/17*

U.S. Cl. 375—4 **22 Claims**



15. A digital signal repeater system comprising:

(a) a receiver for receiving an input signal, producing signals related to such input signal, and producing a demodulated receiver output signal;

(b) a transmitter for transmitting an output signal modulated by such receiver output signal; and

(c) a controller for

(i) receiving such signals related to such input signal from the receiver;

(ii) processing such signals related to such input signal to detect (1) whether such input signal is present, and (2) whether such signals related to such input signal include a predetermined clock frequency component; and

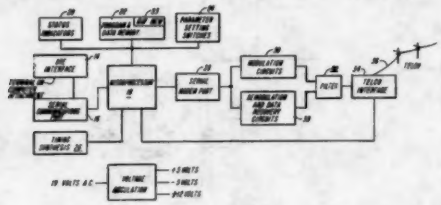
(iii) producing a control signal for controlling said transmitter, such control signal being indicative of whether said two conditions are detected.

4,680,773

DATA TELECOMMUNICATIONS SYSTEM AND METHOD UTILIZING A MULTI-MODE MODEM

Anthony P. Amundson, Holliston, Mass., assignor to Microcom, Inc., Norwood, Mass.

Filed Oct. 30, 1985, Ser. No. 792,766
Int. Cl.[4] H04B *1/38*
U.S. Cl. 375—8 **25 Claims**



1. A method of initiating data telecommunications between two units of data terminal equipment over communication lines, each unit of said data terminal equipment having a modem connected between the unit and the communication lines, at least one of said modems being capable of operating under a special mode and under a normal mode, said special mode providing optimized data transmission that paces the flow of data between said two modems and provides error detection in a transmitted data stream by a receiving modem and automatic retransmission of said data stream by an initiating modem when an error occurs and said normal mode providing direct, non-optimized data transmission that provides transmission of the data stream without any analysis of the data stream, said method comprising the steps of:

(a) establishing a physical connection between said initiating modem and said receiving modem;

(b) transmitting a stream of data characters from said initiating modem of said receiving modem over communication lines;

(c) examining in said receiving modem a next character in said data stream transmitted by said initiating modem to said receiving modem;

(d) attempting to establish a special mode link between said initiating and receiving modems if said next character examined by said receiving modem is a special mode indicating character and attempting to establish a normal mode link if said character is a normal mode indicating character;

(e) repeating steps (c) through (d) after fetching a new data character from the data stream until either a special mode indicating character or a normal mode indicating character is detected or until a preselected period of time has elapsed;

(f) continuing the transmission by said initiating modem of said stream of data if a special or normal mode link is established until said stream is transmitted.

4,680,774

METHOD AND CIRCUIT FOR SUPPRESSION OF QUANTITIZING NOISE AMBIGUITIES

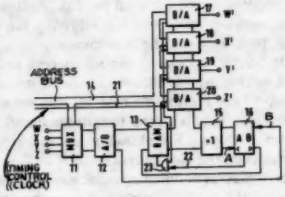
Karl-Heinz Klein, Wiesbaden-Erbenheim, and Wilfried Richter, Rossdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 819,891
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504762
Int. Cl.[4] H03M *1/66*
U.S. Cl. 375—26 **13 Claims**

1. Method to reduce or eliminate quantitizing noise errors upon digital transmission of analog signals by analog/digital (A/D) conversion, transmission of digital signals, and subsequent digital/analog (D/A) reconversion into analog signals, with minimum or no distortion between the original analog signal and the reconverted analog signal,

comprising, in accordance with the invention, the steps of

storing a first digitized signal representative of a first analog value;



comparing first and second sequential digitized signals, discriminating between similar and dissimilar digital signal values and determining the degree of dissimilarity;

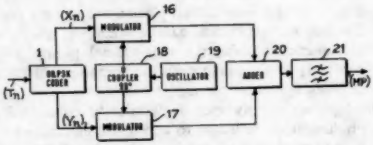
and controlling the D/A conversion to change a conversion of the second digitized signal to an analog signal with respect to the first stored signal only if the discriminated degree of dissimilarity exceeds a predetermined level.

4,680,775

DEVICE FOR CODING-DECODING A BINARY DIGITAL SIGNAL BIT STREAM FOR AN "OQPSK" DIGITAL MODULATOR-DEMODULATOR WITH FOUR PHASE STATES

Jean Exarque, Levallois-Perret, and Michel Camand, Courbevoie, both of France, assignors to Societe Anonyme Dite, Levallois-Perret, France

Filed Jan. 29, 1985, Ser. No. 696,130
Claims priority, application France, Jan. 31, 1984, 84 01466
Int. Cl.[4] H04L *27/18*
U.S. Cl. 375—39 **4 Claims**



1. Device for coding and decoding a binary signal digital bit stream for an OQPSK digital circuit having a modulator and demodulator with four phase states of the kind in which a binary digital signal bit stream with bit rate D is applied in phase with synchronization clock pulses to the input of a coder which produces two digital bit streams with bit rate D/2 at respective first and second inputs of said modulator and a decoder at the output of said demodulator restores a binary digital bit stream with bit rate D, in which device said coder comprises a circuit adapted to divide by 2 frequency of synchronization clock pulses so as to produce synchronization pulses having a period twice that of said synchronization clock pulses, a first logic circuit having inputs connected to receive the bits of said digital bit stream with bit rate D and said synchronization pulses in phase with each bit of said digital bit stream and an output for connection to said first input of said modulator and to deliver each bit of a first digital bit stream with bit rate D/2, said first logic circuit comprises means for assigning each bit of said first digital bit stream with bit rate D/2 the binary value 1 or 0 in accordance with the following logic equation:

$$X_n=(T_n^*\oplus H_n/2)^*\oplus X_{n-1}$$

X_n represents the state of the nth bit of the first digital bit stream with bit rate D/2,
T_n^* represents the complement of the state of the nth bit of the digital bit stream with bit rate D,
= represents the operator "OR",
$H_n/2$ represents the state of the nth synchronization pulse,
$(T_n^*+H_n/2)^*$ represents the complement of the function $(T_n^*+H_n/2)$,
$\oplus$ represents the logic operator "exclusive-OR",
X_{n-1} represents the state of the $(n-1)$th bit of the first digital bit stream with bit rate D/2,

a second logic circuit has an input connected to receive the bits of the digital bit stream with bit rate D and an output for connection to a second input of said modulator and to deliver the bits of a second digital bit stream with bit rate D/2, said second logic circuit is connected to the output of said first logic circuit and comprises means for assigning to each bit of said second digital bit stream with bit rate D/2 the binary value 1 or 0 in accordance with the following logic equation:

$$Y_n=T_n\oplus X_n\oplus X_{n-1}\oplus Y_{n-1}$$

in which equation:

Y_n represents the state of the nth bit of the second digital bit stream with bit rate D/2,
T_n represents the state of the nth bit of the digital bit stream with bit rate D,
X_{n-1} and Y_{n-1} respectively represent the states of the $(n-1)$th bits of said first and second digital bit streams with bit rate D/2,

said decoder comprises a third logic circuit for restoring at the output of said decoder said digital bit stream with bit rate D formed from said first and second digital bit streams with bit rate D/2 as demodulated by said demodulator, and said third logic circuit comprises means for assigning to each restored bit the binary value 1 or 0 in accordance with the following equation:

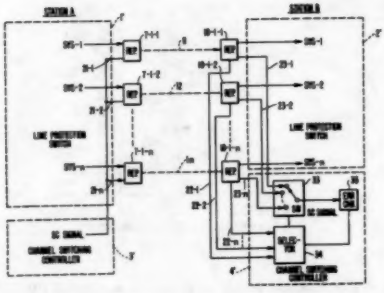
$$T_n=X_n\oplus X_{n-1}\oplus Y_n\oplus Y_{n-1}.$$

4,680,776

PROTECTION SWITCHING SYSTEM FOR CARRIER TRANSMISSION LINE

Satoshi Ikeuchi, Kawasaki, and Ikuo Taniguchi, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 9, 1984, Ser. No. 669,836
Claims priority, application Japan, Nov. 11, 1983, 58-212030; Nov. 18, 1983, 58-217402; Jan. 25, 1984, 59-011256
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—40 **21 Claims**



1. A protection switching system for a digital carrier transmission line transmitting pulse code modulation bit frames having an auxiliary bit area, comprising:

terminal stations, each including a selector for receiving auxiliary signals and means for detecting trouble on the digital carrier transmission line;

at least one main transmission line, operatively connected to said terminal stations, for transmitting main signals between said terminal stations;

means for detecting trouble on said at least one main transmission line; and

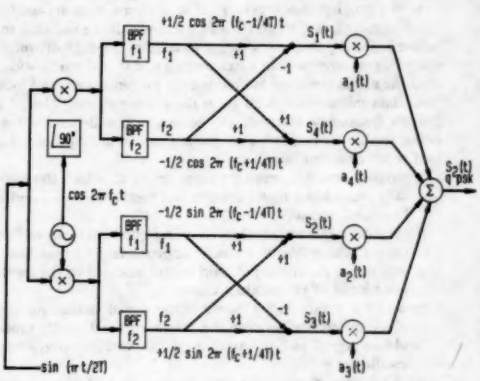
at least one stand by line, operatively connected to said terminal stations, for transmitting the main signal when said means detects trouble on said at least one main transmission line, the auxiliary signals between said terminal stations being transmitted in parallel using at least two lines among said at least one main transmission line and said at least one stand by line, utilizing the auxiliary bit area of the pulse code modulation bit frames, and the selector selecting the auxiliary signals received over one of said stand by line and said main transmission line which is operating normally.

4,680,777

QUADRATURE-QUADRATURE PHASE SHIFT KEYING

Debabrata Saha, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Filed Aug. 13, 1984, Ser. No. 640,057
Int. Cl.[4] H04L *27/10*; H04J *11/00*; H03C *3/00*
U.S. Cl. 375—53 **18 Claims**



1. A modulation method for modulating simultaneously four streams of data pulses, the modulation method comprising the steps of:

combining a pulse-shaping signal with respective ones of first and second carrier signal components, each of said first and second carrier signal components having the same frequency as the other and a quadrature phase relationship with respect to the other, to produce first and second composite modulation signals, each having first and second frequency components;

combining substractively said first and second frequency components associated with each of said first and second composite modulation signals, to produce first and third modulation signals;

combining additively said second and first frequency components associated with each of said first and second composite modulation signals, to produce second and fourth modulation signals; and

combining said first, second, third, and fourth modulation signals with respective ones of the four streams of data pulses, to produce respectively corresponding first, sec-

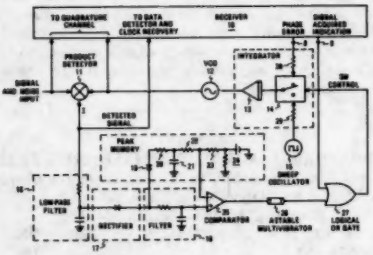
ond, third, and fourth modulated streams of pulses having predetermined pulse shapes and quadrature pulse phase relationships with respect to one another.

4,680,778

FAST ACQUISITION CIRCUIT FOR SYNCHRONOUS DIGITAL RECEIVER OPERATING IN WIDEBAND NOISE

Jerome V. Krinock, Owensboro, Ky., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1985, Ser. No. 783,132
Int. Cl.[4] H04L 27/06
U.S. Cl. 375—97 **4 Claims**



1. In a synchronous receiver for receiving a digitally modulated signal having a carrier and a known data rate, said receiver requiring frequency sweep to acquire the digitally modulated signal from within a frequency band that is much wider than the signal spectrum but having the propensity to false lock onto data sidebands spaced from the carrier at multiples of a known frequency interval, or, because of wideband noise, being unable to employ a frequency discriminator function, said receiver comprising:

a product detector, having a signal input to which the digitally modulated signal couples, an oscillator input, and a baseband output;

a variable frequency oscillator, having a control input and an output whose frequency is an approximately linear function of the control input, said output coupled to the oscillator input of the product detector;

means for producing a phase error signal indicating the phase difference between the carrier of the digitally modulated signal and the output of the variable frequency oscillator;

an integrator having an input coupled to said phase error signal and having an output coupled to the control input of the variable frequency oscillator;

means for sweeping the frequency of the variable frequency oscillator at a predetermined sweep repetition rate to acquire the digitally modulated signal, comprising:

a square wave generator for producing a square wave sweep waveform having predetermined amplitude and period and

sweep control means for selectively coupling either the output of the square wave generator or the output of the means for producing the phase error signal to the input of the integrator; and

a logical signal-acquired indicator, which asserts when the receiver has acquired the digitally modulated signal but which does not assert during false locks,

a signal acquisition circuit in said receiver for controlling the sweep control means, comprising:

a first low pass filter, coupled to the baseband output of the product detector, whose cutoff frequency is substantially less than said known frequency interval to remove wideband noise from said baseband output and to produce a filtered baseband output;

a first rectifier means, coupled to the output of the low pass filter, for rectifying the filtered baseband output and producing a rectified baseband output;

a second low pass filter, coupled to the rectifier means and having a cutoff frequency lower than said known data rate and higher than the predetermined sweep repetition rate, for recovering the envelope of the rectified baseband output and producing an envelope signal;

an envelope peak memory for detecting the peaks of the envelope signal and producing an envelope peak memory signal, comprising:

a second rectifier means and capacitor coupled to the output of the first rectifier means and having a discharge time constant several times the period of the square wave sweep waveform and

means for establishing a minimum charge on said capacitor sufficient, in the absence of signal but presence of noise, to back bias the first rectifier means, whereby the output of the peak memory means, which is proportional to the charge on the capacitor, eventually increases, in the presence of significant detected signal, from a level less than to a level greater than that of the envelope signal;

comparator means, coupled to the sweep control means, for producing a first logical output when the envelope signal exceeds the envelope peak memory signal and a second, different logical output when the envelope peak memory signal exceeds the envelope signal;

an astable multivibrator, whose output asserts in response to the first logical output from the comparator means and remains asserted for a significant fraction of half the period of the square wave sweep waveform after discontinuance of the first logical output from the comparator means;

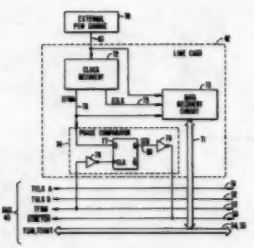
a logical OR gate, which has one input coupled to the output of the astable multivibrator, another input coupled to the signal-acquired indicator, and an output coupled to the sweep control means, whereby the output of the astable multivibrator causes the sweep control means to couple the input of the integrator to the output of the square wave sweep generator to attempt signal acquisition or to the phase error signal to test signal acquisition until the signal has been acquired, after which the signal-acquired indicator asserts and causes the input of the integrator to remain coupled to the phase error signal.

4,680,779

DISTRIBUTED CLOCK SYNCHRONIZATION IN A DIGITAL DATA SWITCHING SYSTEM

John F. Wakerly, Mountain View, Calif., assignor to David Systems, Inc., Sunnyvale, Calif.

Filed Jan. 14, 1985, Ser. No. 692,006
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—107 **14 Claims**



1. A clock synchronization system in a a digital PBX switch having one or more line card modules and a central control module, comprising

a first clock for generating timing signals at a first clock

frequency greater than a nominal frequency, said first clock in said central control module,

a circuit coupled to said local first clock for lowering said first clock frequency, said lowering circuit in said central control module, and

comparator means having a first input coupled to said first clock, and having an output coupled to said lowering circuit for activating said lowering circuit when a second input of said comparator means is coupled to a second clock, said second clock operating at substantially said nominal frequency, to lower said first clock frequency to synchronize said first clock frequency with said second clock, said comparator means in said one or more of said line card modules to distribute said clock synchronization system.

4,680,780

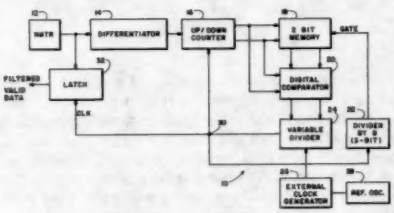
CLOCK RECOVERY DIGITAL PHASE-LOCKED LOOP

Agoston Agoston, Beaverton, and Robert G. Sparkes, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1986, Ser. No. 858,425

Int. Cl.[4] H03D *3/24, 3/18*

U.S. Cl. 375—120 **9 Claims**



1. A digital phase-locked loop circuit for synchronizing a clock to a serial data stream comprising;

(a) variable clock means for producing a series of clock pulses whose frequency is a function of a coded input signal;

(b) up/down counter means responsive to said serial data stream and to said clock pulses for counting in a first direction when the phase of said data stream leads said clock pulses, and for counting in a second direction when the phase of said data stream lags said clock pulses; and

(c) comparator means for comparing a present count of said up/down counter means with a previous count of said up/down counter means, and for providing said coded input signal to said variable clock means to increase the frequency of said variable clock means when the phase of said serial data stream leads said clock pulses, and to decrease the frequency of said variable clock means when the phase of said serial data stream lags said clock pulses.

4,680,781

DATA TELECOMMUNICATIONS SYSTEM AND METHOD WITH UNIVERSAL LINK ESTABLISHMENT

Anthony P. Amundson, Holliston, and Nathan Melhorn, Framingham, both of Mass., assignors to Microcom, Inc., Norwood, Mass.

Filed Oct. 30, 1985, Ser. No. 793,583

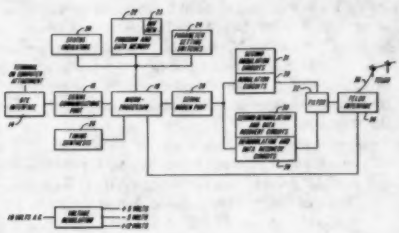
Int. Cl.[4] H04L *1/08, 27/00*

U.S. Cl. 375—8 **9 Claims**

7. A method for establishing a data telecommunications connection between an initiating unit of data terminal equipment and a receiving unit of data terminal equipment, each of the units having an associated modem connected between said unit and communication lines, each of said modems including a means to provide operation at a high speed (4800 bps or above) and a means to provide operation and at a low speed (2400 bps or below), said method comprising the steps of:

establishing a physical connection between said initiating modem and said receiving modem at the low speed;

determining whether said initiating modem and said receiving modem are capable of operating under a special, optimizing matched protocol that provides error detection in a transmitted data stream and automatic retransmission of said data stream when an error occurs;



if said initiating modem and said receiving modem are capable of operating under said matched protocol, establishing a link connection between said initiating modem and said receiving modem under said matched protocal and determining a class of operation under said matched protocol;

if said class of operation is a class providing operation at a high speed, utilizing said link connection to establish a physical connection between said initiating modem and said receiving modem at said high speed.

4,680,782

TOMODENSITOMETRY IMAGE ACQUISITION AND RECONSTRUCTION PROCESS AND A TOMODENSITOMETER USING THIS PROCESS

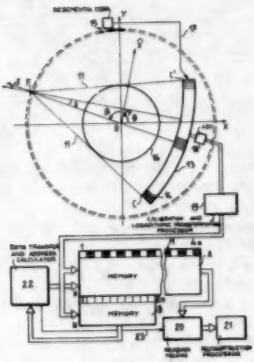
Siv Chang Tan, Paris; Tri Hue Nguyen, Le Pre St. Gervais, and Claude Benchimol, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 19, 1984, Ser. No. 662,715

Claims priority, application France, Oct. 25, 1983, 83 16995

Int. Cl.[4] A61B *6/00*

U.S. Cl. 378—4 **12 Claims**



1. A process for image reconstruction by tomodensitometry of the type including the steps of rotating a radiation source and detectors assembly in the plane of a cross-section the image of which is to be displayed, said radiation source emitting a beam of penetrating radiation in the form of a fan, and

taking and storing a succession of image views for different angles of rotation of the source and detectors assembly with respect to a fixed reference axis, of said plane, the detectors of said assembly being arranged to converge towards a focal point of said radiation source and each view being sampled for angles γ representative of the detectors and indexed from a straight line joining the center of rotation of said radiation source and detectors assembly to said focal point, the angular shift between two adjacent detectors being constant $\Delta\gamma$ and the angular shift between views being constant; with the angular shift between said straight line and the detector the nearest thereto adjusted to $\{\Delta\gamma/4|$ and the following conditions being provided: $\pi/\Delta\gamma e=N$, with N a positive integer, assuming $\gamma e=(1+\alpha)\gamma$, where α is a coefficient dependent on the speed of rotation of the source and detectors assembly and on the time for acquisition of a view, said process further comprising the steps of:

taking and storing two series of views (Vi, Wi) with an angular shift between views of $h\Delta\beta$ for the first series (Vi) and $\Delta\beta$ for the second series (Wi), at least some of the views of the two series being shifted with respect to each other by $|\Delta\gamma e/2|$ with $\Delta\beta=2\Delta\gamma e$, h being a positive interger, completing the views of the first series by sampled values of the second series whose coordinates (θ',γ') located in the space $(\theta,\gamma e)$ with $\theta=\beta+\gamma e$, satisfy the relationship: $(\theta x,\gamma x(=(\theta'+(2k+1)\pi, -\gamma')$ with k a relative integer, $(\theta x,\gamma' x)$ being the coordinates in space $(\theta,\gamma e)$ of desired sampled values of the first series; and

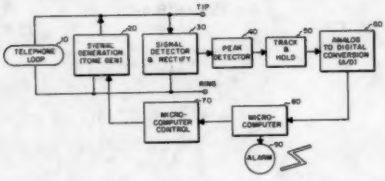
applying a reconstruction algorithm, comprising a convolution and back projection, to the completed views of the first series for reconstituting an image.

4,680,783

TELEPHONE SECURITY VIOLATION DETECTION DEVICE

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communication Systems, Inc., Northlake, Ill.

Filed Dec. 16, 1985, Ser. No. 808,978
Int. Cl.[4] H04M *1/24*
U.S. Cl. 379—6 **4 Claims**



1. The method of detecting unauthorized connections to a telephone line intended to intercept voice or data messages, comprising the steps of:

measuring the impedance of said telephone line as a first preliminary step;

storing said measurement as a base line value as a second preliminary step;

generating a test tone and applying said tone to the telephone line;

measuring the voltage level on said telephone line;

connecting a shunt resistance across said telephone line;

remeasuring the voltage on said line with said shunt resistance connected;

computing the equivalent source impedance based on said two measuring steps;

comparing the computed results to said base line value; and

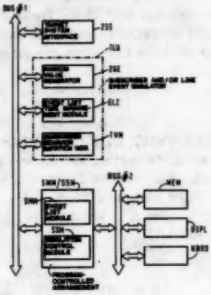
if the computed results vary from the base line value a predetermined amount giving indication of an unauthorized connection, generating an alarm signal.

4,680,784

TRAFFIC SIMULATOR FOR TESTING EXCHANGES TAKING THE SUBSCRIBER-SYSTEM INTERACTION INTO ACCOUNT

Ralf Lehnert, Kalchreuth; Phuoc Tran-Gia, Bietigheim-Bissingen, and Wolfram Lempennau, Stuttgart, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,147
Int. Cl.[4] H04M *3/28*
U.S. Cl. 379—11 **3 Claims**



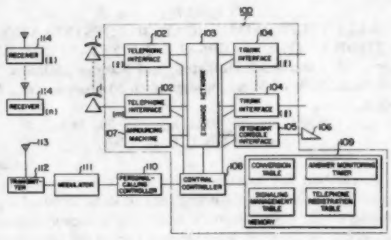
1. An improved traffic simulator for testing a telephone exchange, which simulates the behavior of subscribers and lines connected to the exchange by producing random event variables such as call distances, call durations and reaction times which actuate a program-controlled control arrangement which checks the reaction of the exchange to such events and mixes the statistical technical parameters of the exchange; such improvement being characterized in that the instantaneous behavior of the subscriber and line simulations are not predetermined, but adapt themselves randomly to the system reactions, and that such simulator comprises a first circuit arrangement (TVM) for producing the subscriber and line event simulations, a second circuit arrangement (ELZ) for determining event instants, a third circuit arrangement (ZGE) for producing the random event variables, an interface unit ZSS for transmitting absolute simulation instants to the exchange, and a simulation control (SIS) to which the exchange transfers reports of received events; whereby the reaction times of the exchange to such events can be measured without measuring the internal time delays of the simulator.

4,680,785

PERSONAL-SIGNALING COMMUNICATION SYSTEM

Tadahiko Akiyama, and Yoshio Otsuka, both of Koriyama, Japan, assignors to Nippo Communication Industrial Co., Ltd., Fukushima, Japan

Filed Oct. 3, 1984, Ser. No. 657,199
Int. Cl.[4] H04M *1/276, 1/57*; H04Q *7/04*
U.S. Cl. 379—57 **4 Claims**



1. A personal-signaling communication system comprising: a portable memory device provided with memory means for

storing personal identification information and a portable receiver device provided with receiver means operable in response to receipt of a wireless personal signaling code to provide an indication of received signaling;

a plurality of communication terminal units connected by way of respective lines to an exchange facility and each provided with a reader to read personal identification information stored in said portable memory device and each of which includes means for transferring said personal identification information, a called number signal and an off-hook signal to said exchange facility;

a wireless pager device connected to receive a personal signaling code from said exchange facility for transmitting said personal signaling code by wireless communication to said portable receiver device; and

said exchange facility including means for converting a called number signal, received from a communication terminal unit along with a caller's personal identification information, to a personal signaling code, memory means for storing a personal signaling code in correspondence with said received caller's personal identification information to form a signal management table, comparison means responsive to reception of personal identification information and an off-hook signal from a communication terminal unit for comparing the received personal identification information with data forming said signaling management table as stored in said memory means, first means responsive to said comparison means not detecting the received personal identification information in said signaling management table for transferring a personal signaling code from said converting means to said wireless pager device and for storing said received personal identification information along with said caller's personal identification information in said signaling management table in said memory means, and second means responsive to said comparison means detecting the received personal identification information in said signaling management table for effecting connection selectively between the communication terminal unit from which the personal identification information is received and a line to another communication terminal unit identified by caller's personal identification information derived from said signaling management table in said memory means.

4,680,786

COMMUNICATION SYSTEM FOR PROVIDING BUSINESS COMMUNICATION FEATURES TO CELLULAR MOBILE TELECOMMUNICATION CUSTOMERS

Robin C. Baker, Boulder; Steven E. Brown, Arvada; John R. Lothrop, Longmont; Roman Lozyniak, Westminster, and Paul E. Miller, Northglenn, all of Colo., assignors to AT&T Company and AT&T Information Systems Inc., both of Holmdel, N.J.

Filed Oct. 1, 1985, Ser. No. 782,312
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—60 **14 Claims**

1. A mobile telecommunication complex for providing business communication services to mobile telephone units comprising:

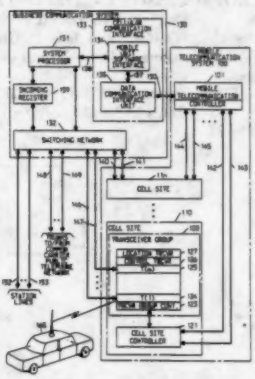
a mobile telecommunication system which provides mobile telecommunication services to one or more mobile telephone units;

a business communication system, including a system processor which controls the operation of said business communication system in response to station status activity associated with a call connection stored therein, for providing business communication services to communication circuits connected to said business communication system;

one or more communication links connecting said mobile telecommunication system and said business communication system for carrying voice communication signals therebetween;

one or more data links connecting said business communication system and said mobile telecommunication system for carrying data therebetween;

wherein said mobile telecommunication system is responsive to control messages from any one of said mobile telephone units for establishing a communication connection between said mobile telephone unit and one of said communication links and for transmitting a control message to said business communication system via one of said data links describing the state of the call connection on said



communication link connected to said one mobile telephone unit;

cellular communication interface means connected between said data links and said system processor for converting said control message from said mobile telecommunication system to station status activity data associated with said call connection, which station status activity data is written by said interface means into said business communication system; and

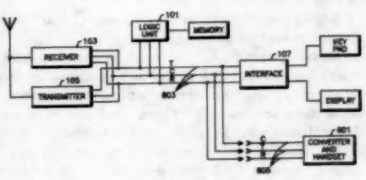
wherein said system processor is responsive to said station status activity data for providing business communication service to said communication link associated with said one mobile telephone unit.

4,680,787

PORTABLE RADIOTELEPHONE VEHICULAR CONVERTER AND REMOTE HANDSET

Patrick J. Marry, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 673,650, Nov. 21, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 907,125
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—63 **38 Claims**



1. A portable radiotelephone having a logic unit, which communicates information with a first internal data device via a data bus and adapted to accept a detachable second external data device on the data bus comprising:

means for detecting the presence of the second data device on the data bus;

means, responsive to said detection of the presence of the second data device, for excluding the first data device and including the second data device in the logic unit information communication; and

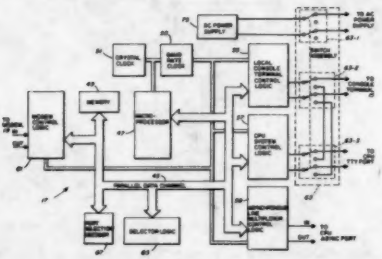
means for detecting a subsequent absence of the second data device from the data bus and for including the first data device while excluding the second data unit from the logic unit information communications.

4,680,788

MICROPROCESSOR BASED CONTROL AND SWITCHING DEVICE

Craig A. Cordeiro, Westford, and John P. Graham, Marlboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Aug. 31, 1983, Ser. No. 528,566
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—93 **22 Claims**



1. A computer network for transmitting and receiving data over a telephone line comprising:

a. a local site, said local site including:

i. a CPU having a TTY port and an ASYNC port,

ii. a local console,

iii. a modem coupled to said telephone line, and

iv. a control and switching device coupled through separate lines to said TTY port, to said ASYNC port, to said modem and to said local console for controlling the flow of data between said CPU said local console and said modem, and

b. a remote site, said remote site including:

i. a remote terminal, and

ii. a modem coupled to said remote terminal and to said telephone line,

c. said control and switching device including:

i. a first port for coupling said control and switching device to said local console,

ii. a second port for coupling said control and switching device to said TTY port,

iii. a third port for coupling said control and switching device to said ASYNC port,

iv. a fourth port for coupling said control and switching device to said modem, and

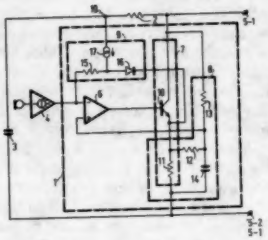
v. a switch assembly having a set of three switches for operating said control and switching device in any one of three modes, one switch arranged to connect said local console to said TTY port and power down said control and switching device for operation in a first mode, another switch arranged to connect said local console to said TTY port and connect said modem at said local site to said ASYNC port for operation in a second mode and said third switch arranged to electronically connect both said local console and said modem at said local site to either said TTY port or said ASYNC port for operation in a third mode.

4,680,789

AUDIO TRANSMISSION CIRCUIT COMPRISING A TRANSMIT AMPLIFIER IN THE FORM OF A LINE VOLTAGE STABILIZER

Peter J. M. Sijbers; Henricus J. M. Otten, both of Eindhoven, and Petrie J. Van Der Plaats, Hilversum, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1985, Ser. No. 705,766
Int. Cl.[4] H04M *1/60*
U.S. Cl. 379—395 **3 Claims**



1. An improved transmit amplifier which stabilizes the subscriber line voltage of a telephone set connected to such line, such telephone set comprising such transmit amplifier and a high-output impedance microphone pre-amplifier, such transmit amplifier being supplied with direct voltage by the subscriber line; such transmit amplifier comprising: an input stage constituted by a feedback operational amplifier having an inverting input and a non-inverting input, the inverting input thereof being connected to the output of the microphone pre-amplifier; an output stage formed by an output transistor having an emitter resistor, such output stage being arranged in parallel with the subscriber line; and a reference voltage source for producing a reference voltage for line voltage stabilization; such improvement being characterized in that such transmit amplifier further comprises:

a voltage divider formed by a first resistor and a parallel arrangement of a second resistor and a capacitor, such voltage divider being in parallel with the subscriber line and the junction of said first and second resistors being connected to the non-inverting input of said operational amplifier, the emitter resistor of said output transistor forming part of said second resistor;

and a feedback circuit connecting the inverting input of said operational amplifier to the emitter of said output transistor, such feedback circuit comprising said reference voltage source and a feedback resistor.

4,680,790

BEDSIDE CONTROL MODULE FOR HEALTHCARE STATIONS AND THE LIKE

Richard F. Packard, Stevens Point, and Kenneth R. Cover, Plover, both of Wis., assignors to Joerns Healthcare, Inc., Stevens Point, Wis.

Filed Aug. 22, 1985, Ser. No. 768,206
Int. Cl.[4] H04Q *1/00*; H04M *1/00*
U.S. Cl. 379—432 **38 Claims**

36. A bedside communicator for hospital beds and the like, comprising:

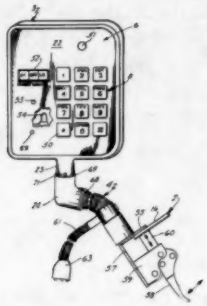
a control panel;

an adjustable arm supporting said control panel in a cantilevered fashion at a position over the bed for access thereto by a patient reclined on the bed; and

a loud speaker telephone having a push-button dial comprising a large-button membrane switch encompassing a major portion of said control panel and a push-button line connect/disconnect controller mounted on said control panel for manual operation by the patient; and wherein

said adjustable arm is sufficiently stiff that said arm will not

normally flex as a result of manipulation of either said dial or said line connect/disconnect controller, and is sufficiently flexible to permit manual deflection of said arm by



patients and other users, whereby the patient can initiate outgoing telephone calls and terminate the same with a single hand from a reclined position in the bed.

4,680,791

DIGITAL VIDEO SIGNAL PROCESS APPARATUS FOR USE IN A VIDEO TAPE RECORDER

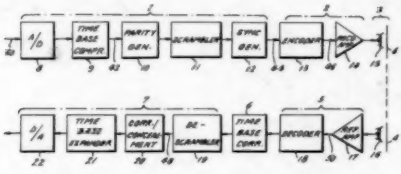
Hideaki Kato, and Shigeru Araki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed May 30, 1985, Ser. No. 739,137

Claims priority, application Japan, May 31, 1984, 59-112720; Aug. 22, 1984, 59-174739

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—8 **12 Claims**



1. A processing apparatus for producing a scrambled signal from a video signal, said video signal being coded to include a cyclic error correcting code, said video signal being organized in a plurality of blocks, each block having a plurality of sub-blocks, each of said sub-blocks including a synchronizing code representing a period of said sub-block, said apparatus comprising:

means for adding address information varying in its content at every sub-block to said synchronizing code;

means, responsive to said address information, for generating a pseudo-random signal based on said address information and having a different code pattern with respect to each of said sub-blocks; and

means responsive to said pseudo-random signal for scrambling said video signal with said pseudo-random signal.

4,680,792

DEMODULATOR COMPRISING AN INDICATOR CIRCUIT FOR USE IN COMMON TO CANCELLATION OF A PILOT SIGNAL AND AN INDICATION OF A RECEPTION STATE

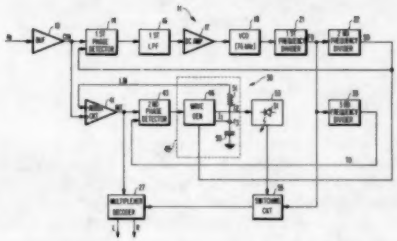
Kouichi Tanaka; Takeshi Kuwajima, and Kiyoshi Amazawa, all of Tokyo, Japan, assignors to NEC Corporation and Clarion Co., Ltd., both of Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,454

Claims priority, application Japan, Mar. 5, 1984, 59-41614

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—12 **6 Claims**



1. A demodulator for use in producing a demodulated signal in response to a circuit input signal which is one of a stereophonic signal accompanied by a pilot signal of a predetermined frequency or a monophonic signal accompanied by no pilot signal, said demodulator comprising signal producing means responsive to said circuit input signal for producing a first local frequency signal having a frequency equal to said predetermined frequency and a second local frequency signal having a frequency equal to said predetermined frequency and a phase different from a phase of said local frequency signal, wherein the improvement comprises:

intermediate signal producing means responsive to said circuit input signal and a local input signal to generate an intermediate signal;

demodulating means coupled to said intermediate signal producing means for demodulating said intermediate signal into said demodulated signal;

phase detecting means coupled to said intermediate signal producing means and responsive to said second local frequency signal for detecting a phase difference between said pilot signal and said second local frequency signal on reception of said stereophonic signal;

first circuit means coupled to said phase detecting means and responsive to said first local frequency signal for producing first and second currents dependent on said phase difference;

second circuit means for feeding said first current back to said intermediate signal producing means as said local input signal, said second circuit means forming a negative feedback loop together with said intermediate signal producing means; and

indicating means responsive to said second current for indicating reception of said stereophonic signal.

4,680,793

NOISE ELIMINATING CIRCUIT

Yoshiro Sugai, and Hiroyuki Kimura, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,753

Claims priority, application Japan, Apr. 24, 1984, 59-82447

Int. Cl.[4] H04H *5/00*

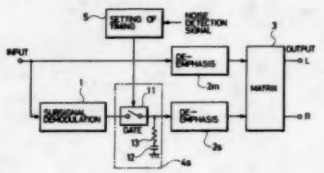
U.S. Cl. 381—13 **6 Claims**

1. A noise eliminating circuit for use in a TV audio multi-demodulator circuit, said noise eliminating circuit comprising: a subsignal demodulator circuit for demodulating a subsignal

from a composite multiplexed signal containing a main signal and a subsignal,

a matrix circuit for effecting arithmetic operations upon said main signal and the demodulated subsignal from said subsignal demodulator circuit to produce first and second output signals, and

sample-and-hold circuit means interposed between said subsignal demodulator circuit and said matrix circuit in a



signal path of said subsignal for sampling and holding said demodulated subsignal in response to a signal synchronized with at least one of a noise detection signal and a noise component contained in said subsignal,

noise elimination being performed only on said demodulated subsignal in said TV audio multi-demodulator circuit, said main signal being passed to said matrix circuit without having noise elimination performed thereon.

4,680,794

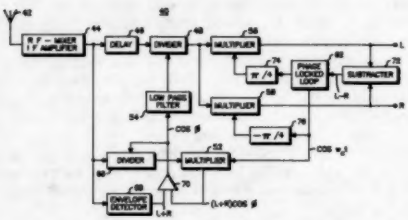
AM STEREO SYSTEM WITH MODIFIED SPECTRUM

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1986, Ser. No. 891,496

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—15 **18 Claims**



1. A transmitter for providing a compatible AM stereophonic signal requiring a correction signal and comprising:

input means for receiving two information signals;

first modulator means for providing a quadrature signal which is phase modulated by an angle whose tangent is the ratio of the difference between the two information signals to one plus the sum of said signals;

circuit means for determining the angle of modulation of said quadrature signal and providing a correction signal proportional to the cosine of said angle;

lowpass filter means coupled to filter said correction signal;

circuit means for extracting the sum of said two information signals from said quadrature signal;

multiplier means for multiplying said sum signal by said filtered correction signal; and

second modulator means coupled to modulate the output of said first modulator means by the output of said multiplier means.

4,680,795

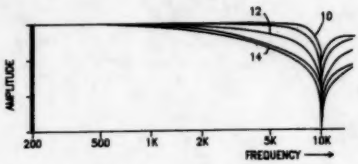
DUAL PURPOSE VARIABLE Q FILTER

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1985, Ser. No. 812,687

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—15 **19 Claims**



1. A dual purpose variable Q notch filter arrangement as for use in an AM sterophonic radio receiver and comprising:

first and second input means for providing respective first and second input signals related to a received sterophonic signal;

first and second notch fitler network means coupled to receive said respective input signals for rejecting a predetermined, narrow band of frequencies having a fixed center frequency;

first and second feedback circuits responsive to the respective outputs of said first and second notch filter network means coupled to supply signals for affecting the Q of said respective network means without affecting said center frequency;

control means coupled to control the signals supplied by each said first and second feedback circuit for providing a tone control function for said receiver, whereby the frequency response of the filter arrangement below said band of frequencies is variable.

4,680,796

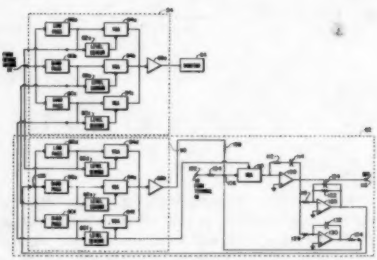
SOUND ENCODING SYSTEM

David E. Blackmer, Wilton, N.H., and James H. Townsend, Jr., Cambridge, Mass., assignors to Kintek, Inc., Waltham, Mass.

Filed Apr. 11, 1986, Ser. No. 850,741

Int. Cl.[4] H04R *5/00*

U.S. Cl. 381—23 **14 Claims**



1. A signal encoding system for generating at least two encoded signals in response to a plurality of information signals containing audio data representative of at least one virtual image so that said encoded signals can be subsequently decoded by a decoding system, including decoding matrix means for decoding said encoded signals, so as to regenerate said information signals, said signal encoding system comprising:

signal encoding means for generating said encoded signals in response to said information signals, said signal encoding means including means for impressing a signal gain on each of said information signals as a function of and in

response to a corresponding control signal; and means for sensing at least a portion of the signal level of each said information signal and for generating the corresponding control signal in response to the respective information signal; and

a substantial duplicate of said decoding matrix means coupled to said signal encoding means for generating a feedback signal corresponding to each of said information signals;

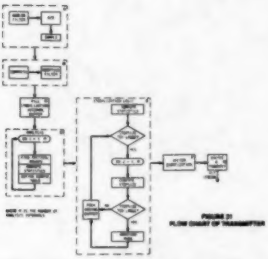
wherein said encoding signals are modified in response to said feedback signals so as to reduce the noise artifacts generated by said decoding matrix when said encoded signals are decoded by said decoding system.

4,680,797

SECURE DIGITAL SPEECH COMMUNICATION

George Benke, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1984, Ser. No. 624,567
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—41 **4 Claims**



1. Signal processing apparatus using critical point coding comprising a transmitter and a receiver, which are interconnected via data transmission means for digitally encoded signals, the transmitter having an input from a voice signal source, and the receiver having a voice-signal output;

wherein the transmitter and receiver have corresponding vector tables, each defining precisely 32 regions which are necessary to quantize all of the vectors contained over a certain interval of time, designated an analysis interval which is equal to eight milliseconds, including bits for the table definition, with the table allowing for one to eight time samples and amplitude values of 0 to 256, to the range of the amplitude arising from two factors, (1) since the default for the vector slope sign is alternating, those vectors which have negative amplitude components are assigned the same regions as the positive amplitude vectors, and (2) with a compression ratio being used of 8:1, the output of a 12-bit A/D converter is reduced from 2048 to 256; whereby a typical 8-msec segment of voiced speech requires about 7 to 10 out of the 32 possible regions to quantize the vectors, and a typical segment of unvoiced speech requires only about 4 to 6 of these regions;

wherein the transmitter comprises:

(a) an analog filter having an upper cutoff frequency of about 3.6 kilohertz, said A/D converter, and sample means coupled in sequence from said voice signal source, to produce digital signals sampled at 16 kilobits per second using 12 bits per sample;

(b) compression means followed by adaptive filter means, with an input of the compression means coupled to said sample means, for compressing the data from the sample means sample-by-sample with a given compression function, for providing said compression ratio, and filtering adaptively according to the structure of the voice signal;

(c) buffer means coupled to the adaptive filter means for storing of digital samples of voice signals during each of successive stabilization intervals equal to 96 milliseconds;

(d) analysis means for analyzing signals from the buffer means during each stabilization interval, with means for dividing each stabilization interval into twelve analysis intervals, and for each analysis interval finding those points in the waveform where it is changing direction most rapidly, these being the critical points, computing statistics, and defining a course table, the statistics being the number of critical points, the number of nonswitches (times when the vector slope does not change sign), and the number of regions of the vector table required for the vectors;

(e) logic means coupled to said analysis means for stabilizing the bit rate by calculating quantization stepsizes such that the number of bits required to code all the vectors is not exceeded, the logic means being effective during each stabilization interval to gather statistics about the signal structure, including the number of vectors, number of nonsign changes in vector slopes, and number of quantization regions, which are used to compute the quantization stepsize for the vectors, the stepsize being calculated in such a way that the bit rate for the entire stabilization interval is fixed at a given rate; with there being three modes for handling the data, a first mode for when the stepsize is below a certain threshold value, with this stepsize being used to quantize all the vectors for the entire stabilization interval, a second mode for calculating the stepsize for the particular analysis interval, this stepsize being used for the vectors contained only for that analysis interval, and a third mode for use when the stepsize for the analysis interval is too large, coding being performed using an unvoiced mode;

(f) vector quantization means for quantizing the vectors using the stepsize calculated by said logic means (e);

(g) encoding means coupled to the vector quantization means for encoding the quantized vectors for each stabilization interval in a digit code using a format comprising a mode word defining which of said modes is being used, a stepsize word, and for each analysis interval, a table descriptor word followed by a sequence of the quantized vectors, including a special vector which indicates nonswitches and one vector which is a stop vector, with the first mode having only one mode word and stepsize word for the entire stabilization interval, and the second and third modes having a mode word and stepsize word for each analysis interval during the stabilization interval, and means for transmitting the resulting code via the data transmission means;

wherein the receiver comprises decode means coupled to receive signals from the data transmission means and to decode the bit stream, extraction means coupled to the decode means to extract the vectors, expansion means coupled to the extraction means to expand the vectors using the inverse of the compression function, and reconstruction means coupled between the expansion means and the voice-signal output using an interpolation function to construct the waveform between the critical points.

4,680,798

AUDIO SIGNAL PROCESSING CIRCUIT FOR USE IN A HEARING AID AND METHOD FOR OPERATING SAME

Leopold Neumann, Lexington, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Jul. 23, 1984, Ser. No. 633,446
Int. Cl.[4] H04R *25/00*; H03G *3/20*
U.S. Cl. 381—68.4 **14 Claims**

1. In a hearing aid of the type having an audio signal processing circuit including an integral computing means for control-

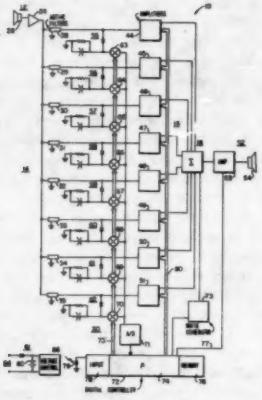
ling the operation thereof, wherein said audio signal processing circuit comprises:

means for receiving an audio frequency electrical signal;

means for separating said audio frequency signal into a plurality of frequency bandwidths;

means for separately amplifying any audio frequency signal present in each of said bandwidths;

means for summing the amplified audio frequency signals from each of said bandwidths to produce a reconstituted signal; and



means for controlling said means for separately amplifying including means for sampling any audio frequency signals present in each of said bandwidths and means for determining, in response to the audio frequency signals sampled from all of said bandwidths, an amplification level for each bandwidths for said means for separately amplifying,

said means for sampling including an analog-to-digital converter, individual detector means for producing an analog signal representative of the level of audio frequency signal present in each of said bandwidths,

and means for sequentially connecting said individual detector means to said analog-to-digital converter.

4,680,799

HEARING AID

Hans Henneberger, Effeltrich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 619,521, Jun. 11, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 873,146

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 8318579[U]

Int. Cl.[4] H04R *25/02*

U.S. Cl. 381—68.6 **12 Claims**

1. A hearing aid with a housing having a shape adapted for insertion into an outer auditory canal which includes a microphone, an amplifier, a receiver and a power source, the housing having a generally frustoconical shape including a planar base portion serving as an exposed wall when the hearing aid is in the outer auditory canal, the exposed wall having an aperture and cover, the cover adapted to close over the aperture and including retaining means on its inner side for accepting and securing the power source, a recess in the housing adapted to contain the retaining means, said recess being accessible via the aperture, a control having an actuating member mounted in said recess in a location to provide access to the actuating member such that it can be adjusted when the cover is opened.

4,680,800

MOVING-COIL LOUDSPEAKER UNIT

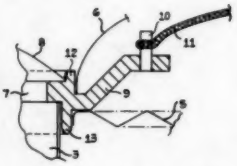
Graham Bank; Stephen Scaife, and Gareth Millward, all of Yorkshire, England, assignors to Wharfedale Loudspeaker Limited, Leeds, England

Filed Apr. 23, 1985, Ser. No. 726,368

Claims priority, application United Kingdom, Apr. 24, 1984, 8410417

Int. Cl.[4] H04R *9/04, 9/06*

U.S. Cl. 381—194 **4 Claims**



1. A moving coil loudspeaker drive unit comprising a diaphragm, a voice coil, a voice coil former and rear suspension spider, the improvement comprising an electrically insulating build-ring adapted to cooperate with one end of the voice coil former and to interconnect the rear suspension spider with the coil former and to accurately locate said spider with respect to the voice coil, and at least one radially extending projection on said build-ring incorporating at least one electrical terminal electrically connected to the voice coil.

4,680,801

SIGN VERIFICATION

Harry J. C. Etherington, Surrey; Paul C. Joslin, Berks, and Rowland A. G. Dunkley, Bedfordshire, all of England, assignors to The De La Rue Company PLC, England

Filed Aug. 30, 1985, Ser. No. 774,595

Claims priority, application United Kingdom, Jan. 9, 1984, 8400390; PCT Int'l Appl., Jan. 9, 1985, PCT/GB85/00009

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—3 **20 Claims**

1. A method of determining whether the writer of a contemporaneously written sign is the same as the writer of a previously written sign, at least one characteristic feature of said previously written sign having been prerecorded, the method comprising the steps of:

(a) obtaining a contemporaneously written sign;

(b) detecting at least one characteristic feature of said contemporaneously written sign;

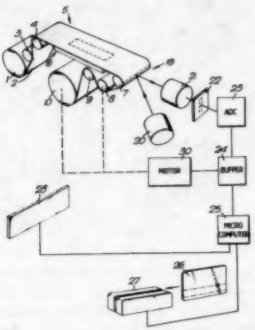
(c) comparing each detected feature of said contemporaneously written sign with a corresponding prerecorded feature of said previously written sign;

(d) generating an acceptance signal if the differences between the detected and the prerecorded features lie within first predetermined limits;

(e) if an acceptance signal cannot be generated, obtaining at least one further contemporaneously written sign and

repeating steps (b) to (d) with respect to each further contemporaneously written sign;

(f) if an acceptance signal cannot be generated for any of said at least one further contemporaneously written sign, comparing the differences between the characteristic features of each contemporaneously written sign and the corresponding characteristics of said previously written sign and, if all the differences fall within second predetermined limits; then



(g) comparing characteristic features of each of said contemporaneously written sign with corresponding characteristic features of the remaining said contemporaneously written signs and generating an acceptance signal if the differences between said corresponding features of all said contemporaneously written signs lie within third predetermined limits.

4,680,802

POSTURE JUDGEMENT SYSTEM IN IMAGE PROCESSING

Yoshie Nishida, Yokohama; Seiji Hata, Fujisawa, and Akira Miyakawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

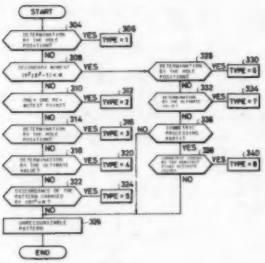
PCT No. PCT/JP85/00144, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/04502, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 25, 1985, Ser. No. 807,880

Claims priority, application Japan, Mar. 26, 1984, 59-56200

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **3 Claims**



1. A posture judgement system in an image processor which recognizes the existence, position and posture of an object and assembles the object by a robot, comprising:

means for imaging objects to provide an input image signal;

means for preparing standard data from the image input signal by classifying the image input signal as representing a:

first type of object if the posture of the object part can be determined on the basis of angles and distances between the centroid of the object and the centroid of each hole included within the object;

second type of object if the posture of the object can be determined on the basis of a ratio $|Y^2/X^2-1|$ of a major axis to a minor axis and a single longest distance connecting the centroid of the object to the periphery of the object;

third type of object if the posture of the object can be determined on the basis of the ratio of a major axis to a minor axis and a pattern of positions of a plurality of holes in the object;

fourth type of component part if the component part is neither a first, second nor third type and if the posture can be determined on the basis of the points at which successive lengths connecting the centroid on the component part and the periphery change from increasing to decreasing values, and the ratio of a major axis to a minor axis;

fifth type of component part if the component part is neither a first, second, third nor fourth type and if the posture of the component part can be determined on the basis of the ratio of a major axis to a minor axis after the posture has been changed by 180 degrees;

sixth type of component part if the posture of the component part can be determined on the basis of the ratio of a major axis to a minor axis and angles and distances between lines connecting the centroid of the component part and the centroids of each hole in the component part;

seventh type of component part if the component part is neither a first nor sixth type and if the posture of the component part can be determined on the basis of points at which the lengths connecting the centroid of the component part and the periphery of the component part change from increasing to decreasing values;

eighth type of component part if the component part is neither a first, sixth nor seventh and if the posture of the component part can be determined on the basis of a determination of senmetry;

unrecognizable pattern if the component part is neither a first, second, third, fourth, fifth, sixth, seventh nor eighth type;

and

means for recognizing the posture of the desired component parts by comparing the standard data with parameters providing a basis for determining the type of component part represented by said image input signals.

4,680,803

METHOD AND APPARATUS FOR ISOLATING IMAGE DATA FOR CHARACTER RECOGNITION

Antonio Dilella, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1984, Ser. No. 683,074

Int. Cl.[4] G06K *9/34*

U.S. Cl. 382—9 **8 Claims**

1. A process of segmenting data bits derived in response to scanning characters, comprising the steps of:

(a) isolating a descrete group of said data bits which may be associated with more than one character;

(b) examining said discrete group of data bits according to predetermined criteria in search for a

Possible joint between first and second groups of data bits within said group;

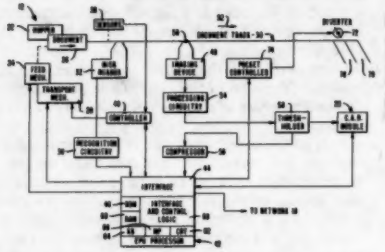
(c) selecting a segmentation vector according to second predetermined criteria to separate said first and second groups of data bits; and

(d) separating said first and second groups of data bits at said joint along a selected said segmentation vector;

said data bits consisting of binary ones and zeros and said selecting step including the step of:

(c-1) finding the length of the shortest segmentation vector consisting of binary ones which lies within a predetermined range and which also provides a path of binary zero from the outward end of said segmentation vector to a predetermined side of the associated object;

said predetermined range being given by the equation:



$$MP-MP/2 \leq R \leq (MP+MP/2);$$

wherein MP is equal to the midpoint of said discrete group of data bits and R is equal to said predetermined range.

4,680,804

METHOD FOR DESIGNATING A RECOGNITION MODE IN A HAND-WRITTEN CHARACTER/GRAPHIC RECOGNIZER

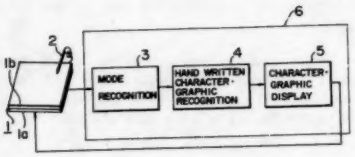
Soshiro Kuzunuki, Katsuta; Hiroshi Shojima, Hitachi; Takanori Yokoyama, Hitachi; Yasushi Fukunaga, Hitachi, and Kotaro Hirasawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 716,943

Claims priority, application Japan, Mar. 28, 1984, 59-58298

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—13 **8 Claims**



1. A method for designating a recognition mode in a hand-written character/graphic recognizer for recognizing a character/graphic in a character recognition mode or a graphic recognition mode designated in accordance with stroke information supplied from input means which samples a hand-written character/graphic and converts it to the stroke information, and converting the recognized character/graphic to a charater/graphic code, said method comprising the steps of:

extracting a characteristic value of the character/graphic from the stroke information supplied from said input means, said characteristic value being the stroke length determined from coordinates of the stroke included in the stroke information;

discriminating between character information and graphic information based on the extracted characteristic value each time each stroke information is supplied from said input means; and

designating one of the character recognition mode and the graphic recognition mode in accordance with the result of said discrimination.

4,680,805

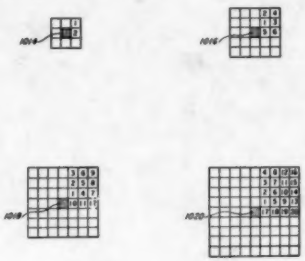
METHOD AND APPARATUS FOR RECOGNITION OF DISCONTINUOUS TEXT

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1983, Ser. No. 552,956

Int. Cl.[4] G06K 9/30, 9/48

U.S. Cl. 382—22 **5 Claims**



1. The method of character recognition comprising:

(a) storing data representative of a sample character having individual pixels in the sample character,

(b) locating a starting pixel on the periphery of said sample character,

(c) storing the starting pixel as a reference pixel,

(d) testing pixels starting on a pixel located in a column and a row adjacent to the column and row of the starting pixel and testing all pixels in that adjacent column for K number of pixels, K being variable and greater than 1;

(e) testing each pixel in the next adjacent column to the just tested column starting on a pixel in a row adjacent to the row of the reference pixel, performing the testing for K columns,

(f) testing each pixel in the same row as the reference pixel, performing the testing for K pixels in that same row,

(g) stopping the testing of steps d–f whenever a black pixel is located, storing it as the reference pixel and repeating steps d–h,

(h) when steps d–f have been completed and no black cell has been located rotating the reference coordinates 90 degrees so as to present a new set of columns and rows, the old rows now being columns and the old columns now being rows with respect to the reference cell and repeating steps d–h,

(i) stopping the testing when the beginning pixel has been returned to as the starting pixel,

(j) recognizing the sample character, and;

(k) outputting an indication of the identity of the sample character.

4,680,806

EDGE LOCATION MEASURING HEAD

Claus A. Bolza-Schünemann, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,047

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444172; Dec. 20, 1984, 3446531

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—65 **7 Claims**

1. An arrangement for recording the position of an edge of a body, preferably an edge of a print carrier in a rotary printing machine, characterized by the improvement that a first oscillator is in effective contact via a dataline with a pulse divider stage;

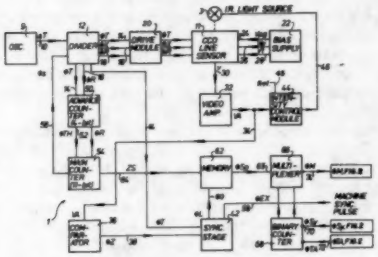
that said pulse divider stage is in effective contact via corresponding signal lines with a drive module stage, via data

lines with an advance counter, and via a signal line with a synchronization stage;

that the advance counter is in effective contact via signal lines with a main counter and via a signal line with said pulse divider stage;

that the main counter is in effective contact via a signal line with a memory stage, and said memory stage is in effective contact with a multiplexer stage via a signal line;

that said drive module stage is in effective contact via signal lines with a CCD line sensor and that this, in turn, is in effective contact with a voltage supply stage and via a signal line with a video amplifier stage;



that said video amplifier stage is in effective contact via signal lines with an intensity control module and with a comparator, the output of the comparator being in effective contact via a signal line with said synchronization stage;

that said synchronization stage is in effetive contact via a signal line with said memory stage;

that a third counter is provided which is in effective contact via signal lines with said multiplexer;

that said synchronizing stage has an input for an external switch pulse;

that said multiplexer has a pulse output; and

that said third counter has inputs for the acceptance of synchronization and clock pulses.

4,680,807

METHOD AND DEVICE FOR IDENTIFYING DATA SUPPORTS

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 592,535, May 14, 1984, abandoned, which is a continuation of Ser. No. 247,165, Mar. 24, 1981, Pat. No. 4,493,107. This application Sep. 11, 1985, Ser. No. 774,860

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011317

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—58 **4 Claims**

1. A device for identifying a data support, comprising:

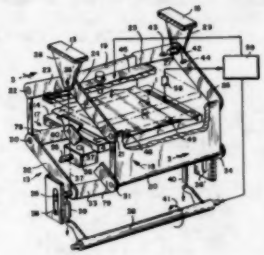
means for engaging said data support;

means for moving an engaged data support into an automatic processing system including a detection system for detecting information on said data support along a linear detection path; and

aligning means for aligning said data support in a detection position to bring said linear detection path into coincidence with a central track between two opposed edges of the data support, including

a first alignment member engaging a first edge of said opposed edges of said data support and a second alignment member engaging a second edge of said opposed edges of said data support, said first and second alignment members being disposed on opposite sides of said linear detection track and being reciprocally movable in an operating direction parallel to the plane of the data support transversely to said linear detection path,

and driving means for moving said first alignment member in said operating direction towards said linear detection path



and simultaneously moving said second alignment member in a direction opposite to said operating direction of said first alignment member towards said linear detection track while keeping both alignment members symmetrically disposed on opposite sides of said linear detection tracks.

4,680,808

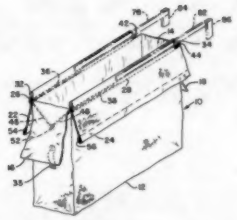
COMPACTOR RECEPTACLE

Maurice Paleschuck, 140 Redwood Dr., Roslyn, N.Y. 11576

Filed Jan. 3, 1986, Ser. No. 816,061

Int. Cl.[4] B65D 33/10

U.S. Cl. 383—9 **16 Claims**

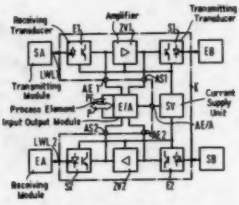


1. In combination a compactor, a receptacle within said compactor for the collection of refuse and adapted to be crushed thereby to compact the trash contained therein, said receptacle comprising a bag with an open end and formed from a porous fabric of hydrophobic material capable of containing liquid in the absence of the application of a pressure in said liquid means adapted for suspending said bag with the open end up within said compactor, the latter said means including means adjacent the opening in said bag for facilitating the insertion and withdrawal of said bag into and out of said compactor, and said compactor including means for crushing the sides of said bag thereby compacting the refuse therein.

4,680,809
LIGHT WAVEGUIDE COUPLING DEVICE

Hans-Otto Hartkopf, and Christoph Zeller, both of Brunswick, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,014
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317541
Int. Cl.[4] G02F 1/00; G02B 6/28; H04B 3/38
U.S. Cl. 455—601 6 Claims

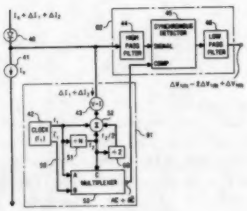


1. A light waveguide device for use in a light waveguide transmission system to regenerate an optical signal even at locations where no data branching is provided, said device comprising two channels with one channel for each direction of transmission of optical signals, each channel having receiving transducer means for converting the optical signals into electrical signals, amplifying means to regenerate the electrical signals into amplified electrical signals, and transmitting transducer means for converting the amplified electrical signals into optical signals for further transmission on an optical waveguide of the system, each channel having at least one connection terminal being connected between an output of the receiving transducer means and an input of the transmitting transducer means, each connection terminal being directly accessible from the outside of the divice so that the device can be subsequently used to link another unit into the system with signals in each channel being coupled out to the unit and another signal from the unit being coupled into each channel.

4,680,810
MEANS FOR CONTROLLING A SEMICONDUCTOR DEVICE AND COMMUNICATION SYSTEM COMPRISING THE MEANS

Robert G. Swartz, Highlands, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Labs, Murray Hill, N.J.

Filed Jun. 28, 1985, Ser. No. 749,746
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—609 30 Claims



1. A communication system comprising a semiconductor laser source of electromagnetic radiation having a V/I characteristic that relates a laser voltage to a laser current that comprises a bias current;

means for modulating the radiation at a signal frequency;

an optical fiber transmission channel;

means for coupling the modulated electromagnetic radiation into the optical fiber at a first fiber location; and

means for detecting the modulated electromagnetic radiation, after its transmission through the optical fiber from the first to a second fiber location;

CHARACTERIZED IN THAT the system further comprises regulating means adapted for maintaining the bias current substantially equal to the current corresponding to a predetermined point on the V/I characteristic, the regulating means comprising

(a) first means that comprise

(i) test current generating means that are conductively connected to the laser source such that the laser current comprises a test current comprising at least a first nonsinusoidal component having a frequency f_1 that is substantially lower than the signal frequency, with the laser voltage comprising a test current-caused component; and

(ii) means, responsive to the laser voltage, for producing a first signal that is substantially proportional to the test current-caused component of the laser voltage;

(b) second means, responsive to the first signal, for producing a second signal that is substantially proportional to a derivative of the V/I characteristic at the predetermined point on the V/I characteristic;

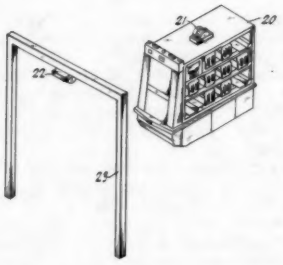
(c) third means, responsive to the second signal, for obtaining an error signal, with the amplitude of the error signal being a function of the amplitude of the second signal; and

(d) fourth means for changing the bias current in response to the error signal.

4,680,811
VEHICLE TO FIXED STATION INFRARED COMMUNICATIONS LINK

James G. Harper; Louis G. Bailey, both of Dallas; Robert B. McJohnson, Pilot Point; Ganesh Rajagopal, Richardson, and Don R. Walker, Coppell, all of Tex., assignors to Veeco Integrated Automation Inc., Dallas, Tex.

Filed Dec. 13, 1984, Ser. No. 681,113
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—617 14 Claims



1. An infrared communications link for optically transmitting and receiving information to control an automatically guided vehicle in an electromagnetically hostile environment, said link comprising:

transmitting means disposed at a fixed location in said electromagnetically hostile environment for processing a signal into a pulsed data signal;

an infrared light source, disposed at said fixed location, having a plurality of infrared illumination devices disposed in a predetermined arc, and coupled to said transmitting means for converting the pulsed data signal into pulsed infrared energy, each of said infrared illumination

devices for transmitting said pulsed infrared energy to a predetermined location in said hostile environment, said transmitting means including means for mounting said infrared illumination devices so that said predetermined locations overlap wherein said infrared illumination devices include a plurality of light emitting diodes disposed at predetermined locations on the outer surface of a half cylindrical pod;

infrared detecting means disposed on said vehicle for detecting the pulsed infrared energy of said infrared light source;

receiving means disposed on said vehicle and coupled to said infrared detecting means for recovering the pulsed data signal from the pulsed infrared energy;

an infrared light source and transmitting means disposed on said vehicle; and

infrared detecting means and receiving means disposed at said fixed location, said infrared detecting means including a plurality of photodiodes also disposed on the outer surface of said half cylindrical pod.

290,780

BABY PANTS

Eva Wistrand, St. Lund, S-64 040 St. Sundby, Sweden

Filed Nov. 6, 1984, Ser. No. 668,666

Claims priority, application Fed. Rep. of Germany, May 7, 1984, MR 22 620

Term of patent 14 years

U.S. Cl. D2—10

290,781

ATHLETIC SHOE OUTSOLE

Guy Grubel, Methuen, Mass., assignor to Converse Inc., North Reading, Mass.

Filed Sep. 11, 1984, Ser. No. 649,429

Term of patent 14 years

U.S. Cl. D2—320

290,782

ATHLETIC SHOE OUTSOLE

Guy Grubel, Methuen, Mass., assignor to Converse Inc., North Reading, Mass.

Filed Sep. 11, 1984, Ser. No. 649,430

Term of patent 14 years

U.S. Cl. D2—320

290,783

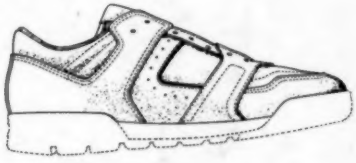
SHOE UPPER

Lawrence Selbiger, Portland, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to PENSA, Inc., Portland, Oreg.

Filed Aug. 22, 1986, Ser. No. 899,030

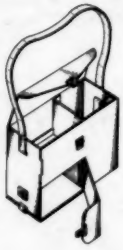
Term of patent 14 years

U.S. Cl. D2—314

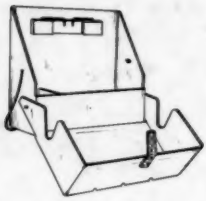


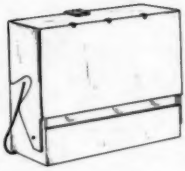
290,784
ORTHOPEDIC CANE
Moussa Moshiri, 11200 Lockwood Dr., Apartment 1720, Silver Spring, Md. 20901
Filed Jun. 12, 1985, Ser. No. 743,899
Term of patent 14 years
U.S. Cl. D3—7

290,785
COMPARTMENTED CARRYING CONTAINER
Hanora M. P. Kelly, 135 High Street, Uxbridge, Middlesex, England
Filed Dec. 17, 1984, Ser. No. 682,229
Claims priority, application United Kingdom, Oct. 25, 1984, 1022887
Term of patent 14 years
U.S. Cl. D3—30.1

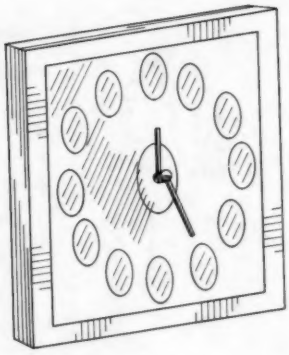


290,786
TOILETRY CASE
Stephen J. Townley, 2190 Como Ave., St. Paul, Minn. 55108
Filed Nov. 26, 1984, Ser. No. 675,086
Term of patent 14 years
U.S. Cl. D3—39

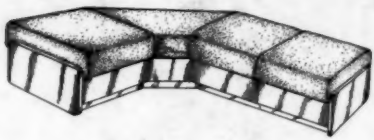




290,787
COMBINATION PHOTOGRAPHIC FRAME AND CLOCK
Dell T. Chisholm, 1010 Fairmount Ave., St. Paul, Minn. 55105
Filed Apr. 8, 1983, Ser. No. 483,213
Term of patent 14 years
U.S. Cl. D6—301

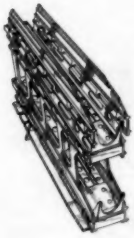


290,788
SEAT
William B. Raftery, Arlington, Tex., assignor to Steelcase, Inc., Grand Rapids, Mich.
Division of Ser. No. 494,120, May 13, 1983. This application Oct. 21, 1985, Ser. No. 789,557
Term of patent 14 years
U.S. Cl. D6—355

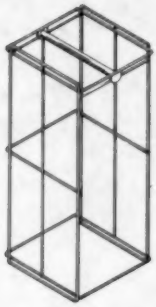


290,789
FRAME FOR A STACK CHAIR
Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.
Filed Jan. 14, 1985, Ser. No. 691,409
Term of patent 14 years
U.S. Cl. D6—380

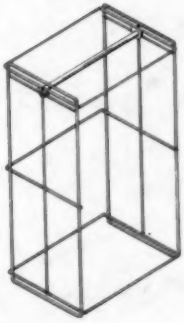
290,790
DISPENSER RACK FOR CANS OR BOTTLES
Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of Ill., assignors to RTC Industries, Inc., Chicago, Ill.
Filed Mar. 26, 1985, Ser. No. 716,328
Term of patent 14 years
U.S. Cl. D6—408



290,791
MODULAR DISPLAY RACK
Melvin E. Kester, Concord, N.C., assignor to Fieldcrest Cannon, Inc., Eden, N.C.
Filed Aug. 30, 1984, Ser. No. 646,361
The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—411

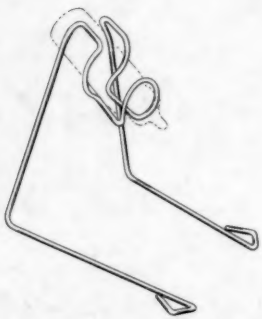


290,792
MODULAR DISPLAY RACK
Melvin E. Kester, Concord, N.C., assignor to Fieldcrest Cannon, Inc., Eden, N.C.
Filed Aug. 30, 1984, Ser. No. 646,358
The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—411

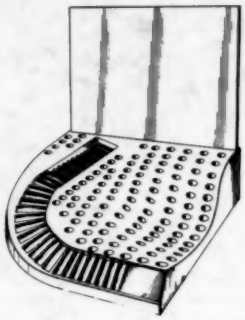


290,793
DISPLAY STAND
Rudolph Lukezich, and Richard Lukezich, both of 1211 N. Maple, Royal Oak, Mich. 48067
Continuation of Ser. No. 418,408, Sep. 9, 1982. This application Sep. 24, 1984, Ser. No. 653,098
Term of patent 14 years
U.S. Cl. D6—462

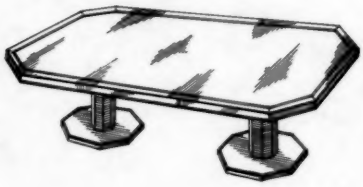
290,794
NURSING BOTTLE HOLDER
Frank C. Mingledorff, Jr., Rte. 10, Box 221, Canton, Ga. 30114
Filed Apr. 29, 1985, Ser. No. 728,655
Term of patent 14 years
U.S. Cl. D6—462



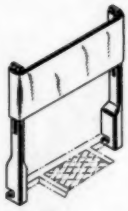
290,795
MERCHANDISING DISPLAY
James L. Gebhardt, Alpharetta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 12, 1984, Ser. No. 660,468
Term of patent 14 years
U.S. Cl. D6—469



290,796
TABLE
Robert B. Becker, North Salem, N.Y., assignor to Helikon Furniture Co., Taftville, Conn.
Filed Nov. 26, 1984, Ser. No. 674,607
Term of patent 14 years
U.S. Cl. D6—480

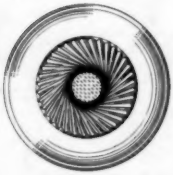


290,797
FOLDABLE BACK REST FOR A CANOE SEAT
Robert M. Hartt, R.F.D. #1, Box 5100, Morrisville, Vt. 05661
Filed Feb. 11, 1985, Ser. No. 700,529
Term of patent 14 years
U.S. Cl. D6—502

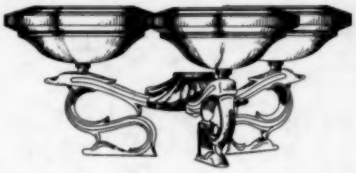


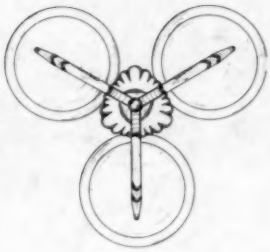
290,798
LAVATORY BRUSH WITH STAND
Alessandro Zuliani, Udine, Italy, assignor to Cosdatto SpA, Martignacco, Italy
Filed Mar. 1, 1985, Ser. No. 707,328
Claims priority, application Italy, Sep. 3, 1984, 60435/84
Term of patent 14 years
U.S. Cl. D6—551

290,799
GOBLET OR SIMILAR ARTICLE
David H. Inns, Retford, England, assignor to Glass Blubs Limited, Chesterfield, England
Division of Ser. No. 535,986, Sep. 26, 1983, Pat. No. Des. 284,631. This application May 14, 1986, Ser. No. 863,402
Claims priority, application United Kingdom, May 12, 1983, 1012993
Term of patent 14 years
U.S. Cl. D7—13

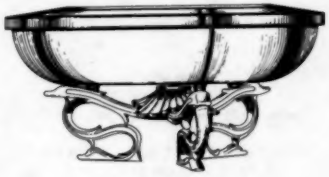


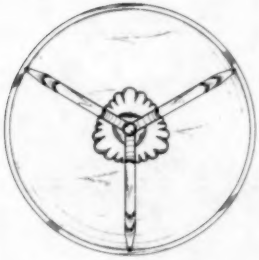
290,800
CAVIAR DISPLAY UNIT
Christian Petrossian, 12 Rue Duroc, Paris, France 75007
Filed Jun. 22, 1984, Ser. No. 623,780
Claims priority, application France, Dec. 23, 1983, 213,620
Term of patent 14 years
U.S. Cl. D7—22



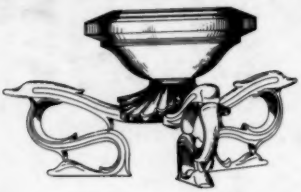


290,801
CAVIAR DISPLAY UNIT
Christian Petrossian, 12 Rue Duroc, Paris, France 75007
Filed Jun. 25, 1984, Ser. No. 623,783
Claims priority, application France, Dec. 23, 1983, 213,621
Term of patent 14 years
U.S. Cl. D7—22

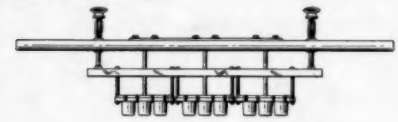




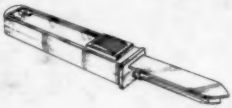
290,802
CAVIAR DISPLAY UNIT
Christian Petrossian, 12 Rue Duroc, Paris, France 75007
Filed Jun. 22, 1984, Ser. No. 623,779
Claims priority, application France, Dec. 23, 1983, 213,619
Term of patent 14 years
U.S. Cl. D7—22

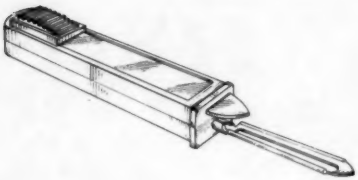


290,803
PASTRY MAKER
Michael J. Sommerfield, Swenson Dr., Rte. 7, Chippewa Falls, Wis. 54729
Filed Mar. 18, 1985, Ser. No. 713,008
Term of patent 14 years
U.S. Cl. D7—43

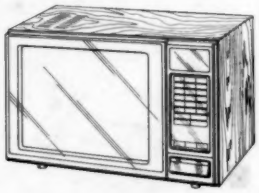


290,804
COMBINED FOOD PEELER AND SLICER
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Feb. 21, 1985, Ser. No. 703,938
Term of patent 14 years
U.S. Cl. D7—147

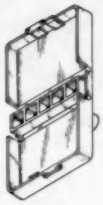




290,805
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 19, 1984, Ser. No. 662,940
Claims priority, application Japan, Apr. 19, 1984, 59-15843
Term of patent 14 years
U.S. Cl. D7—351



290,806
TELEPHONE LIGHT BULB REPLACEMENT TOOL
Kenneth W. Hotchkiss, 8898 Ute Dr., Blue Mountain, Golden, Colo. 80401; George H. Bramhall, 212 Pine Brook Hills, Boulder, Colo. 80302, and John A. Popken, 6 Sunset Cir., Longmont, Colo. 80501
Filed May 21, 1984, Ser. No. 612,704
Term of patent 14 years
U.S. Cl. D8—14



290,807
RESISTANCE WELDING ELECTRODE
Russell A. Nippert, Columbus, Ohio, assignor to The Nippert Company, Delaware, Ohio
Filed Aug. 13, 1984, Ser. No. 640,282
Term of patent 14 years
U.S. Cl. D8—30

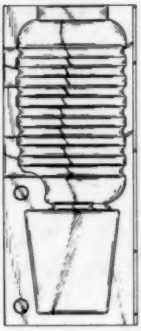
290,808
KITCHEN SCISSORS
Erkki O. Linden, Billnäs, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Oct. 25, 1983, Ser. No. 545,368
Term of patent 14 years
U.S. Cl. D8—57

290,809
GARDEN HOSE HOLDER
James J. Elliott, 700 Museum Dr., Charlotte, N.C. 28207
Filed Nov. 4, 1985, Ser. No. 794,460
Term of patent 14 years
U.S. Cl. D8—356

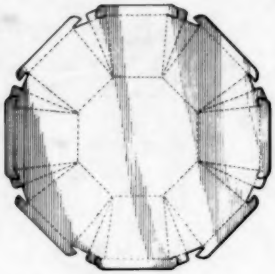
290,810
CONTAINER FOR DISPENSING BAGS FOR BAGGING SOILED DIAPERS AND THE LIKE
Karen L. Miller, 123 E. Dennett, Fresno, Calif. 93728; Linda L. Turner, 53681 Ave. 13½, Madera, Calif. 93637, and Erma L. Henderson, 5715 E. Austin Way, Fresno, Calif. 93727
Filed Nov. 19, 1984, Ser. No. 672,932
Term of patent 14 years
U.S. Cl. D9—318

290,811
DRUM
C. Peyton Cleveland, Jr., Dallas, Tex., assignor to International Chempack Corporation, Hurst, Tex.
Filed Aug. 3, 1984, Ser. No. 637,417
Term of patent 14 years
U.S. Cl. D9—349

290,812
PLANT PACKAGE
Albert J. Voges, Leidsestraat 83, 2182 DJ Hillegom, Netherlands
Filed Feb. 5, 1985, Ser. No. 698,294
Term of patent 14 years
U.S. Cl. D9—426

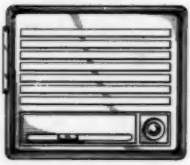


290,813
BLANK FOR AN OCTAGONAL TRAY
Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Mar. 21, 1985, Ser. No. 714,213
Term of patent 14 years
U.S. Cl. D9—433

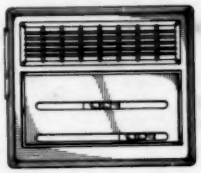


290,814
TIMER
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 11, 1985, Ser. No. 710,316
Term of patent 14 years
U.S. Cl. D10—40

290,815
TIMER
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 18, 1985, Ser. No. 712,523
Term of patent 14 years
U.S. Cl. D10—40

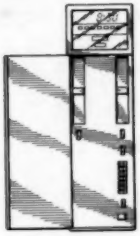


290,816
TIMER
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 11, 1985, Ser. No. 710,402
Term of patent 14 years
U.S. Cl. D10—40



290,817
ELECTRONIC CURRENCY TESTER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Nov. 6, 1984, Ser. No. 668,862
Claims priority, application United Kingdom, May 24, 1984, 1019888
Term of patent 14 years
U.S. Cl. D10—46

290,818
CONTROLLER FOR AIR CONDITIONERS
Hisashi Tomozawa, Odawara; Hideyuki Ikeda, Kanagawa; Isao Arai, Hiratsuka, and Shigeru Saito, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1984, Ser. No. 682,092
Claims priority, application Japan, Jul. 4, 1984, 59-27675
Term of patent 14 years
U.S. Cl. D10—49

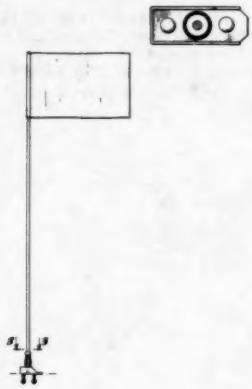


290,819
SINGLE TURN CURRENT TRANSFORMER FOR USE AS A CURRENT SENSOR
Bayard W. Hart, Colorado Springs, Colo., assignor to Dayle R. Smith, Colorado Springs, Colo.
Filed Jun. 25, 1984, Ser. No. 624,393
Term of patent 14 years
U.S. Cl. D10—80

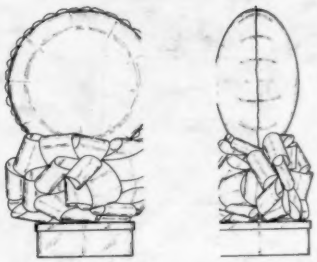
290,820
PORTABLE WATER QUALITY TESTER
Jack P. Slovak, Huntington Beach, Calif., assignor to Pro Water Systems, Inc., Costa Mesa, Calif.
Filed Aug. 20, 1984, Ser. No. 642,379
Term of patent 14 years
U.S. Cl. D10—81

290,821
JEWEL
Peter Deville, Dietzenbach, Fed. Rep. of Germany, assignor to Deville Verlag GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Jul. 25, 1984, Ser. No. 634,444
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 73 MR 9252; Mar. 21, 1984, 73 MR 9284
Term of patent 14 years
U.S. Cl. D11—89

290,822
SPRING LOADED FLAG
Martin J. McEntee, 4898 Beach Blvd., Buena Park, Calif. 90621
Filed May 14, 1984, Ser. No. 609,885
Term of patent 14 years
U.S. Cl. D11—166



290,823
COMBINED BALLOON AND CANDY CENTERPIECE
Gail Gardiner, and Arthur R. Gardiner, both of 24 Kevin Rd., Commack, N.Y. 11725
Filed Oct. 14, 1986, Ser. No. 918,800
Term of patent 14 years
U.S. Cl. D11—184



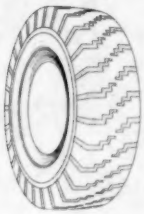
290,824
MOTORCYCLE
Takeo Miura, Saitama, and Junji Kikuchi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 4, 1984, Ser. No. 677,721
Claims priority, application Japan, Jun. 5, 1984, 59-23248
Term of patent 14 years
U.S. Cl. D12—110

290,825
INFANT CARRIER
Richard A. Mathies, and JoAnne Mathies, both of 675 Oberlin Ave., Kensington, Calif. 94708
Filed Dec. 5, 1984, Ser. No. 678,299
Term of patent 14 years
U.S. Cl. D12—129

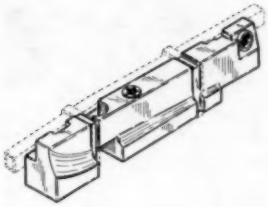
290,826
AUTOMOBILE TIRE
Kozaburo Nakaseko, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 11, 1984, Ser. No. 649,379
Claims priority, application Japan, Jul. 2, 1984, 59-27519
Term of patent 14 years
U.S. Cl. D12—147

290,827
TIRE FOR A VEHICLE WHEEL
Peter R. Marriott, Hurley Near Atherstone, England, assignor to Dunlop Limited, United Kingdom
Filed Jun. 20, 1984, Ser. No. 622,585
Claims priority, application United Kingdom, Jan. 14, 1984, 1017319
Term of patent 14 years
U.S. Cl. D12—147

290,828
AUTOMOBILE TIRE
Takashi Nishimura, and Masafumi Kawakami, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Jul. 10, 1984, Ser. No. 629,469
Claims priority, application Japan, Apr. 16, 1984, 59-15439
The portion of the term of this patent subsequent to May 19, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—150



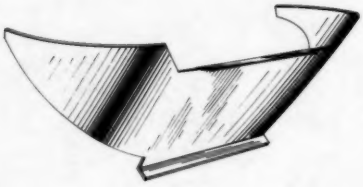
290,829
AUXILIARY VEHICLE GAS TANK
Lynn A. Balek, 1627 8th SW., Mason City, Iowa 50401
Filed Sep. 27, 1985, Ser. No. 781,051
Term of patent 14 years
U.S. Cl. D12—155



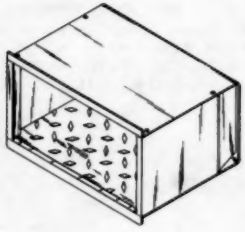
290,830
GRILLE FOR AN AUTOMOBILE
Shinichi Inada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Nov. 21, 1985, Ser. No. 806,000
Term of patent 14 years
U.S. Cl. D12—163

290,831
GEAR SHIFT LEVER FOR BICYCLES
Henri Juy, Dijon, France, assignor to Etablissements le Simplex, France
Filed May 9, 1984, Ser. No. 608,557
Claims priority, application France, Sep. 11, 1983, 83 4159
Term of patent 14 years
U.S. Cl. D12—179

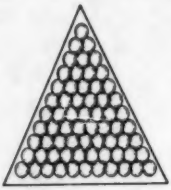
290,832
WIND DEFLECTOR FOR VEHICLES
Mark A. Mayhugh, 3324 S. Glen Park Ct., New Berlin, Wis. 53151
Filed Oct. 8, 1985, Ser. No. 785,573
Term of patent 14 years
U.S. Cl. D12—181



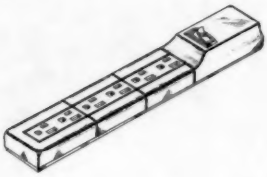
290,833
STEP FOR A VEHICLE
Ralph L. Walters, 1109 38th Ave., Meridian, Miss. 39305
Filed Dec. 10, 1984, Ser. No. 680,470
Term of patent 14 years
U.S. Cl. D12—203



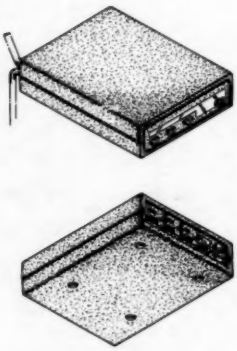
290,834
SAIL
Howard N. Christ, 291 Cedar Ave., Islip, N.Y. 11751
Filed Oct. 28, 1985, Ser. No. 791,982
Term of patent 14 years
U.S. Cl. D12—317



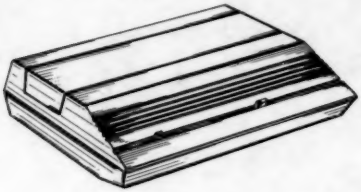
290,835
MULTI-OUTLET CENTER
Robert H. Lovett, Eden Prairie; Jay J. Kakuk, Minneapolis, and Bart T. Ellson, Eden Prairie, all of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Dec. 11, 1985, Ser. No. 807,718
Term of patent 14 years
U.S. Cl. D13—30



290,836
SWITCHING STATION
Klaus H. Oesterheld, Woodside, and Carlos Martinez, Brooklyn, both of N.Y., assignors to Kensington Microware Limited, New York, N.Y.
Filed Dec. 5, 1984, Ser. No. 678,324
Term of patent 14 years
U.S. Cl. D13—32



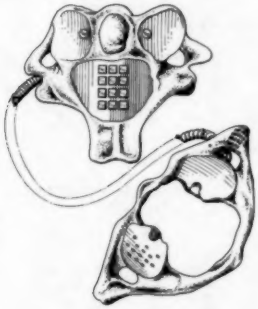
290,837
TELEPHONE ANSWERING MACHINE
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.
Filed Sep. 18, 1984, Ser. No. 651,757
Term of patent 14 years
U.S. Cl. D14—4



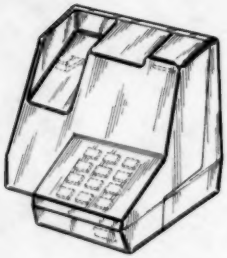
290,839
TELEPHONE
Jai-Ming Chen, No. 166, Sec. 1, Chung-Shan Rd., Yung-Ho, Taipei Hsien, Taiwan
Filed Jan. 27, 1986, Ser. No. 822,592
Term of patent 14 years
U.S. Cl. D14—53

290,838
MICROPHONE
Rebecca M. Stames, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,759
Term of patent 14 years
U.S. Cl. D14—12

290,840
SKELETAL SPINAL BONE-SHAPED TELEPHONE SET
Donald L. Hensley, 3445 Gulling Rd., Reno, Nev. 89503
Filed Jul. 22, 1986, Ser. No. 887,915
Term of patent 14 years
U.S. Cl. D14—53

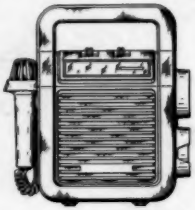


290,841
HOUSING FOR A DESK TELEPHONE PAYSTATION BASE
E. Randall Cochran, Decatur, Ala., assignor to GTE Communication Systems, Northlake, Ill.
Filed Feb. 15, 1985, Ser. No. 702,283
Term of patent 14 years
U.S. Cl. D14—60

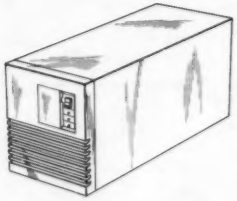


290,842
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE
William J. Scheid, and Bruce A. Claxton, both of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 23, 1984, Ser. No. 664,286
Term of patent 14 years
U.S. Cl. D14—68

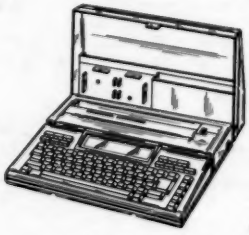
290,843
COMBINED RADIO AND MICROPHONE
Patrick J. Murphy, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,786
Term of patent 14 years
U.S. Cl. D14—72



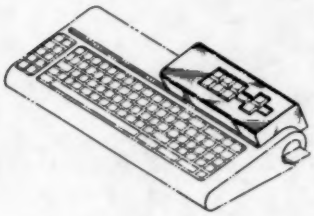
290,844
DISC DRIVE
Shinji Shibuya, Koganei; Koushirou Adachi, Tokorozawa, and Yasuji Morishita, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 19, 1984, Ser. No. 672,592
Term of patent 14 years
U.S. Cl. D14—109



290,845
COMBINED WORD PROCESSOR-PRINTER
Takahisa Yubisui; Hiroshi Sakaguchi; Katsuhiro Iida; Megumi Shinohara, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 16, 1984, Ser. No. 610,671
Claims priority, application Japan, Nov. 16, 1983, 58-49947
Term of patent 14 years
U.S. Cl. D14—111



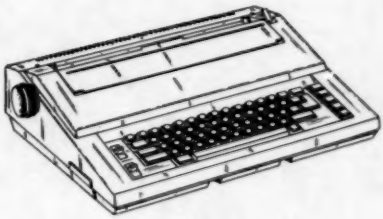
290,846
COMPUTER KEYBOARD CASING
Leonard J. Genest, 1331 E. Edinger Ave., Santa Ana, Calif. 92705
Filed Oct. 9, 1984, Ser. No. 659,106
Term of patent 14 years
U.S. Cl. D14—114



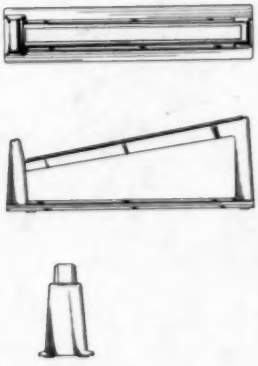
290,847
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Dec. 20, 1985, Ser. No. 811,392
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 16 272
Term of patent 14 years
U.S. Cl. D16—119

290,848
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Dec. 20, 1985, Ser. No. 811,338
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 16272
Term of patent 14 years
U.S. Cl. D16—119

290,849
ELECTRONIC TYPEWRITER
Bernd Gubbe, Nuremberg, and Klaus D. Krause, Dietenhofen, both of Fed. Rep. of Germany, assignors to Triumph-Adler A.G., Nuremberg, Fed. Rep. of Germany
Filed Dec. 20, 1985, Ser. No. 811,435
Claims priority, application Switzerland, Jul. 2, 1985, DM/005492
Term of patent 14 years
U.S. Cl. D18—1

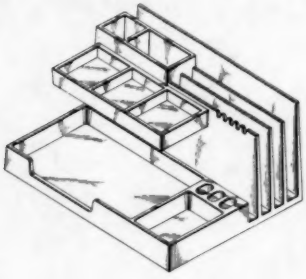


290,850
COMPUTER PRINTER STAND
Jae H. Yon, Houston, Tex., and Brad Nemeth, San Francisco, Calif., assignors to Wendell R. Brooks, Inc., Fort Worth, Tex.
Filed Aug. 4, 1986, Ser. No. 892,210
Term of patent 14 years
U.S. Cl. D18—23

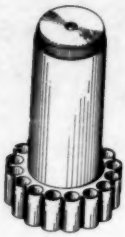


290,851
CRAYON
Kenkichi Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha Buncho, Tokyo, Japan
Filed Sep. 4, 1984, Ser. No. 647,019
Term of patent 14 years
U.S. Cl. D19—41

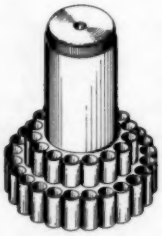
290,852
DESK-TOP ORGANIZER
Henry C. H. Wang, Taipei, Taiwan, assignor to Two Powers Enterprise Co., Ltd., Taipei, Taiwan
Filed Nov. 29, 1984, Ser. No. 675,987
Term of patent 14 years
U.S. Cl. D19—75



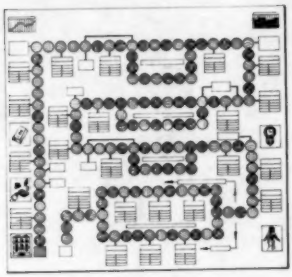
290,853
CRAYON HOLDER
Mel Appel, Livingston, N.J., assignor to The Mel Appel Company, Short Hills, N.J.
Filed Dec. 13, 1984, Ser. No. 681,307
Term of patent 14 years
U.S. Cl. D19—85



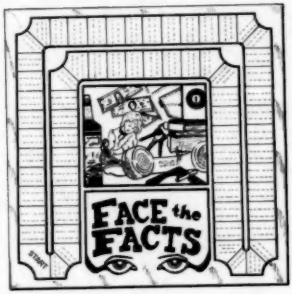
290,854
CRAYON HOLDER
Mel Appel, Livingston, N.J., assignor to The Mel Appel Company, Short Hills, N.J.
Filed Dec. 13, 1984, Ser. No. 681,305
Term of patent 14 years
U.S. Cl. D19—85



290,855
GAME BOARD
James J. Manning, 308 Winkworth Pkwy., Syracuse, N.Y. 13215
Filed Nov. 28, 1984, Ser. No. 675,898
Term of patent 14 years
U.S. Cl. D21—25

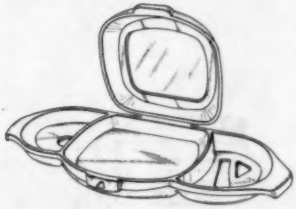


290,856
GAME BOARD
Joan M. Lester, Rte. 1, Box 139A, Effie, Minn. 56639
Filed Feb. 27, 1985, Ser. No. 706,139
Term of patent 14 years
U.S. Cl. D21—25



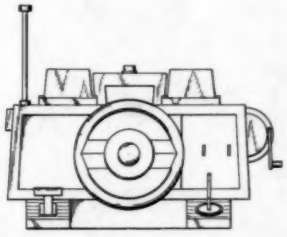
290,857
COMBINED MAGNETIC SPINNER AND TRACKWAY
Raymond J. Lohr, 5043 Sterrettania Rd., Erie, Pa. 16506
Filed Mar. 11, 1985, Ser. No. 710,488
Term of patent 14 years
U.S. Cl. D21—92

290,858
TOY VANITY
M. Allyson Smith, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 25, 1985, Ser. No. 695,182
Term of patent 14 years
U.S. Cl. D21—121

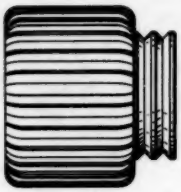


290,859
TOY LAWNMOWER
Larry R. Nagode, and David E. Moomaw, both of East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,784
Term of patent 14 years
U.S. Cl. D21—124

290,860
TOY DASHBOARD
Howard S. Kamentsky, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,742
Term of patent 14 years
U.S. Cl. D21—142



290,861
TOY TIRE AND WHEEL ASSEMBLY
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,747
Term of patent 14 years
U.S. Cl. D21—141



290,862
BOY CLOWN RAG DOLL
Betty L. Koester, R.R. 1, Box 232, Poseyville, Ind. 47633, and Janet F. Adler, R.R. 2, Box 219, Haubstadt, Ind. 47639
Filed Feb. 15, 1985, Ser. No. 702,163
Term of patent 14 years
U.S. Cl. D21—173

290,863
DOLL
Otis L. Dockery, 2214 Maple Gate, Missouri City, Tex. 77489
Filed Mar. 11, 1985, Ser. No. 710,373
Term of patent 14 years
U.S. Cl. D21—177

290,864
DOLL
Anita I. McLellan, 541 Charlotte Dr., San Marcos, Calif. 92069
Filed Dec. 14, 1984, Ser. No. 682,256
Term of patent 14 years
U.S. Cl. D21—185

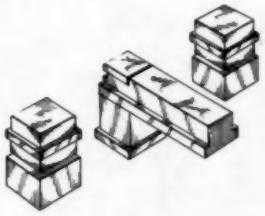
290,865
SKI POLE HANDLE
Jan H. Rustad, Lillehammer, Norway, assignor to Trygve Liljedahl Skistavfabrikk A/S, Lillehammer, Norway
Filed Apr. 3, 1984, Ser. No. 596,424
Claims priority, application Norway, Nov. 2, 1983, 64.561
Term of patent 14 years
U.S. Cl. D21—230

290,866
CARTRIDGE CASE
M. Gaines Chestnut, 17219 W. 57th Pl., Golden, Colo. 80401
Filed Jul. 5, 1984, Ser. No. 627,816
Term of patent 14 years
U.S. Cl. D22—108

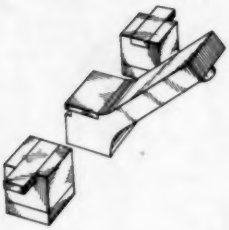
290,867
FISHING LURE
Ernest J. Ross, 2306 - 153rd Street, Surrey, British Columbia, Canada V4A 4R2
Filed Nov. 16, 1984, Ser. No. 672,287
Claims priority, application Canada, May 25, 1984, 25-05-84-12
Term of patent 14 years
U.S. Cl. D22—126

290,868
HAND-HELD BATTERY OPERATED TOOL FOR STRIPPING FISHING LINE FROM A REEL AND FOR SHARPENING FISH HOOKS
James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa
Filed Sep. 28, 1984, Ser. No. 655,648
Term of patent 14 years
U.S. Cl. D22—149

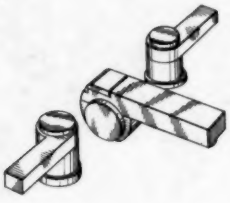
290,869
LAVATORY SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Oct. 15, 1985, Ser. No. 787,247
Term of patent 14 years
U.S. Cl. D23—25



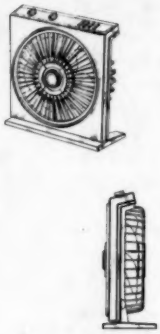
290,870
LAVATORY SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Oct. 15, 1985, Ser. No. 787,248
Term of patent 14 years
U.S. Cl. D23—25



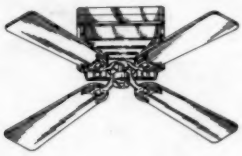
290,871
LAVATORY SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Oct. 15, 1985, Ser. No. 787,245
Term of patent 14 years
U.S. Cl. D23—25



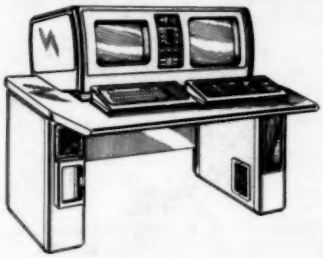
290,872
ELECTRIC FAN
Shuichi Kouno, Tokorozawa; Toshiyuki Utsuki, Tokyo; Hideki Sakae, Hino, and Kenichi Watanabe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,728
Claims priority, application Japan, Nov. 2, 1984, 59-45114
Term of patent 14 years
U.S. Cl. D23—155



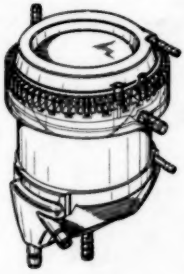
290,873
CEILING FAN
Shang C. Chen, No. 140, Chung Shan Rd., Feng Yuan City, Taiwan
Filed Sep. 18, 1985, Ser. No. 777,100
Term of patent 14 years
U.S. Cl. D23—158



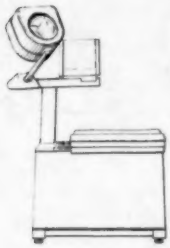
290,874
OPERATOR CONSOLE FOR COMPUTERIZED TOMOGRAPHY SCANNER SYSTEM
Kenneth E. Wagner, Chesterland, Ohio, assignor to Technicare, Corporation, Cleveland, Ohio
Filed Aug. 1, 1984, Ser. No. 636,540
Term of patent 14 years
U.S. Cl. D24—2



290,875
OXYGENATOR FOR USE IN OPEN HEART
Anthony Badolato, Willingboro, N.J.; Edmund R. Corey, Jr., Montclare, and James G. Barrera, Audubon, both of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.
Filed Jan. 8, 1985, Ser. No. 690,006
Term of patent 14 years
U.S. Cl. D24—8



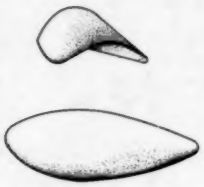
290,876
AUTOMATIC APPARATUS FOR MEASURING OF ARTERIAL BLOOD PRESSURE
Giovanni Arduini, Milan; Lorenzo Bonfanti, Usmate, and Gianfranco Salvemini, Binasco, all of Italy, assignors to Daniele Ghigini, Pavia, Italy
Filed Oct. 9, 1984, Ser. No. 658,632
Claims priority, application Italy, Apr. 11, 1984, 21515/84[U]
Term of patent 14 years
U.S. Cl. D24—21



290,877
MID-FACIAL ZYGOMA SKELETAL IMPLANT
Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J. 07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013
Filed Mar. 26, 1984, Ser. No. 593,265
Term of patent 14 years
U.S. Cl. D24—33

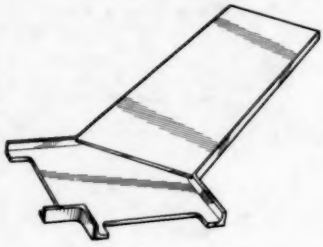
290,878
MID-FACIAL MAXILLA SKELETAL IMPLANT
Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J. 07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013
Filed Mar. 26, 1984, Ser. No. 593,254
Term of patent 14 years
U.S. Cl. D24—33

290,879
MID-FACIAL ZYGOMATIC ARCH SKELETAL IMPLANT
Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J. 07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013
Filed Mar. 26, 1984, Ser. No. 593,255
Term of patent 14 years
U.S. Cl. D24—33

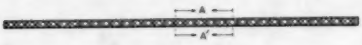


290,880
PORTABLE URINE SPECIMEN COLLECTOR FUNNEL
Joan Blanton, 4612 N. Habana Ave., Tampa, Fla. 33614
Continuation-in-part of Ser. No. 495,820, May 18, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,077
Term of patent 14 years
U.S. Cl. D24—54

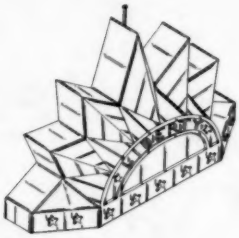
290,881
CORNER PIECE FOR A BASE PLATE VENTILATION SYSTEM
Christer Rittinge, Nybrogatan 3, S-252 50 Helsingborg, Sweden
Filed Oct. 11, 1984, Ser. No. 659,705
Claims priority, application Sweden, Apr. 18, 1984, 84-1283
Term of patent 14 years
U.S. Cl. D25—55



290,882
SYNTHETIC RESIN TUBE
Koui Inoue, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Japan
Filed Oct. 22, 1984, Ser. No. 663,617
Claims priority, application Japan, Jul. 18, 1984, 59-29966
Term of patent 14 years
U.S. Cl. D25—73



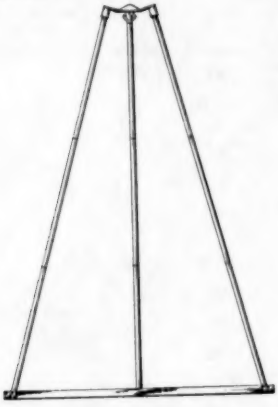
290,883
CANDLE
Joseph J. Comazzi, P.O. Box 985, Greensboro, N.C. 27402, assignor to Joseph J. Comazzi, Greensboro, N.C.
Filed Dec. 5, 1985, Ser. No. 804,889
Term of patent 14 years
U.S. Cl. D26—7



290,884
PORTABLE RECHARGEABLE LIGHT
Koichiro Sano; Satoru Usami, and Tadahide Okuno, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 28, 1984, Ser. No. 675,576
Claims priority, application Japan, May 31, 1984, 59-22454
Term of patent 14 years
U.S. Cl. D26—65

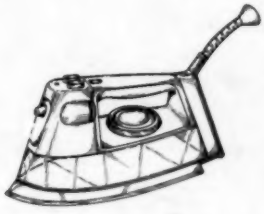
290,885
TABLE LAMP
Uko Morita, 182 Halleck St., Brooklyn, N.Y. 11231
Filed Apr. 5, 1984, Ser. No. 597,183
Term of patent 14 years
U.S. Cl. D26—110

290,886
TRIPOD STAND FOR A LANTERN OR SIMILAR ARTICLE
Rudolph B. Meoli, Brea, and Keith W. Blaylock, Orange, both of Calif., assignors to Kamp Industries, Inc., Brea, Calif.
Continuation of Ser. No. 715,283, Mar. 25, 1985, abandoned.
This application Apr. 28, 1986, Ser. No. 858,240
Term of patent 14 years
U.S. Cl. D26—138

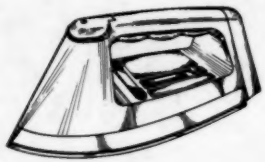


290,887
ELECTRIC SHAVER
Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, and Kazuyoshi Yonezawa, Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan
Filed Aug. 6, 1985, Ser. No. 763,014
Claims priority, application Japan, Mar. 4, 1985, 59-8418
Term of patent 14 years
U.S. Cl. D28—49

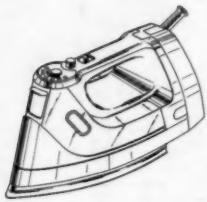
290,888
STEAM IRON
Franz A. Stützer, and Michael Knöchner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Sep. 30, 1985, Ser. No. 781,940
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 5 MR 10588
Term of patent 14 years
U.S. Cl. D32—70



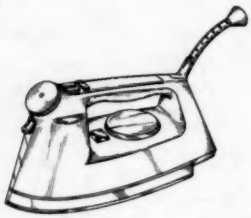
290,889
STEAM IRON
Norman A. Steinkamp, La Grange Park, Ill., assignor to John Zink Company, Tulsa, Okla.
Filed May 31, 1985, Ser. No. 740,130
Term of patent 14 years
U.S. Cl. D32—70



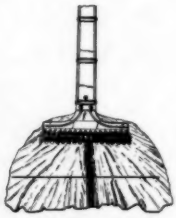
290,890
ELECTRIC IRON
Koichi Ueno; Nobuhiro Umehara, and Osamu Otaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Heating Appliances Co., Ltd., Kamo, both of, Japan
Filed Oct. 30, 1985, Ser. No. 792,862
Claims priority, application Japan, Jul. 15, 1985, 60-29912
Term of patent 14 years
U.S. Cl. D32—70



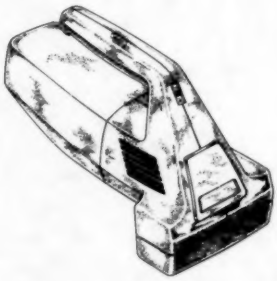
290,891
STEAM IRON
Franz A. Stützer, and Michael Knöchner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany
Filed Sep. 30, 1985, Ser. No. 781,766
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 5 MR 10588
Term of patent 14 years
U.S. Cl. D32—70



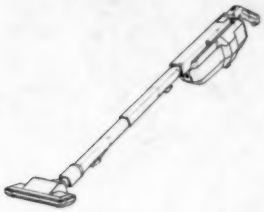
290,892
COMBINED FLOOR SCRUBBER AND MOP
Hans E. Slany, Mulbergerstrasse 90, D-7300 Esslingen/Neckar, Fed. Rep. of Germany
Filed Nov. 15, 1984, Ser. No. 671,549
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 6 MR 1331
Term of patent 14 years
U.S. Cl. D32—15



290,893
HAND HELD SUCTION CLEANER OR THE LIKE
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Mar. 22, 1985, Ser. No. 714,986
Term of patent 14 years
U.S. Cl. D32—18



290,894
VACUUM CLEANER
Issbin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 27, 1984, Ser. No. 686,781
Claims priority, application Japan, Jun. 27, 1984, 59-26464
Term of patent 14 years
U.S. Cl. D32—22



290,895
BATTERY POWERED SUCTION BROOM
Joyce K. Thomas, and Samuel E. Hohulin, both of Lexington, Ill., assignors to National Union Electric Corporation, Cleveland, Ohio
Filed Feb. 22, 1985, Ser. No. 704,386
Term of patent 14 years
U.S. Cl. D32—22

290,896
VACUUM CLEANER
Young S. Kim, Terrace Sunnyvale, Calif., assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 3, 1984, Ser. No. 677,181
Term of patent 14 years
U.S. Cl. D32—24

290,897

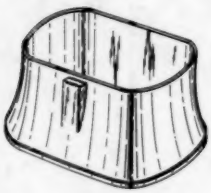
BUCKET

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Geerpres, Inc., Muskegon, Mich.

Filed May 16, 1985, Ser. No. 735,171

Term of patent 14 years

U.S. Cl. D32—53



290,898

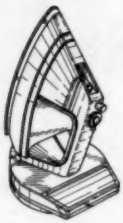
COMBINED IRON AND BASE THEREFOR

Ronald E. Babros, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Oct. 16, 1985, Ser. No. 787,886

Term of patent 14 years

U.S. Cl. D32—68



290,899

ELECTRIC IRON

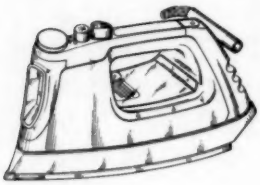
Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France

Filed Jun. 11, 1985, Ser. No. 743,652

Claims priority, application France, Dec. 19, 1984, 845720

Term of patent 14 years

U.S. Cl. D32—70



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. G. Associates: *See—*
Gat, Anita S.; and Westerberg, Eugene R., 4,680,451, Cl. 219-411.000.

Aadams Merchandising, Inc.: *See—*
Kakavas, Dorothy A., 4,679,818, Cl. 280-33.99A.

Aagano, Toshitaka: *See—*
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.

AB Tetra Pak: *See—*
Inoko, Kenji, 4,679,685, Cl. 198-461.000.

Abbey, Kirk J.: *See—*
Lin, Ju-Chui; and Abbey, Kirk J., 4,680,354, Cl. 526-172.000.

Abbott Laboratories: *See—*
Luly, Jay R.; Plattner, Jacob J.; and Fung, Anthony K., 4,680,284, Cl. 514-18.000.

Abdo, Milton K.; and Jennings, Alfred R., Jr., to Mobil Oil Corporation. Method for modifying injectivity profile with ball sealers and chemical blocking agents. 4,679,629, Cl. 166-281.000.

Abe, Masao; and Miura, Nobuo, to Honda Giken Kogyo Kabushiki Kaisha. Ignition system. 4,679,540, Cl. 123-602.000.

Abe, Takao: *See—*
Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, 4,680,763, Cl. 371-37.000.

Abo, Keiju: *See—*
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Abrams, Paul G.: *See—*
Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.

Abreu, Edward. Scoring guide and glass cutter system. 4,679,476, Cl. 83-886.000.

Accurate Industries, Inc.: *See—*
Rasmussen, Robert, 4,679,979, Cl. 414-786.000.

Ace, Ronald S. Ophthalmic glass/plastic laminated lens having photochromic characteristics and assembly thereof. 4,679,918, Cl. 351-163.000.

Acetarin, Jean-Dominique; Villiger, Werner; and Carlemalm, Eric, to Chemische Werke Lowi GmbH. Embedding media suitable for the preparation of thin sections of embedded biological materials. 4,680,362, Cl. 526-320.000.

Acharya, Kishore C.: *See—*
Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., 4,680,709, Cl. 364-414.000.

Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, to Nestec S.A. Resealable pack. 4,679,701, Cl. 220-404.000.

Adachi, Masao: *See—*
Goto, Yasuo; and Adachi, Masao, 4,679,465, Cl. 74-805.000.

Adachi, Takashi: *See—*
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.

Adamchick, John T.: *See—*
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.

Adams, George W. Township, city and regional land arrangement. 4,679,363, Cl. 52-169.300.

Adams, Ronald D.: *See—*
Chia, E. Henry; and Adams, Ronald D., 4,679,613, Cl. 164-453.000.

ADC Telecommunications, Inc.: *See—*
Pitsch, Daniel M., 4,679,880, Cl. 439-404.000.

Adell, Robert, to U.S. Product Development Company. Method of de-emphasizing the gap between a door edge and adjacent structure. 4,679,290, Cl. 29-407.000.

Adenco Engineering AB: *See—*
Jilken, Ann-Christin, 4,679,371, Cl. 52-574.000.

Adenier, Herve : *See—*
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve ; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.

Adler, David M. Exercise device. 4,679,788, Cl. 272-93.000.

Advanced Extraction Technologies, Inc.: *See—*
Mehra, Yuv R., 4,680,042, Cl. 62-17.000.

Advanced Micro Devices, Inc.: *See—*
Ramachandra, Govardhan; and Bhatt, Kiran M., 4,679,310, Cl. 29-577.00R.
Tam, Aloysius T., 4,680,738, Cl. 365-239.000.

Advanced Micro Electronic Components and Systems: *See—*
Bove, Bertrand, 4,679,643, Cl. 177-210.00C.

Advanced Products Ltd.: *See—*
Livne, Avinoam, 4,679,615, Cl. 165-1.000.

AE PLC: *See—*
Munro, Robert; and Day, Roger A., 4,679,493, Cl. 92-212.000.

Aeras Water Resources, Inc.: *See—*
Arbisi, Dominic S.; and Replogle, Coy E., 4,680,148, Cl. 261-120.000.

Aetna Telecommunications Laboratories: *See—*
Roberge, James K., 4,680,554, Cl. 330-260.000.

Agfa Gevaert Aktiengesellschaft: *See—*
Wernicke, Ubbo; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jurgen, 4,680,123, Cl. 210-683.000.

Agoston, Agoston; and Sparkes, Robert G., to Tektronix, Inc. Clock recovery digital phase-locked loop. 4,680,780, Cl. 375-120.000.

Agulhon, Claude, to Royal Champignon. Process for improving the technical efficiency and preservation quality of canned mushrooms. 4,680,188, Cl. 426-281.000.

Ahroni, Joseph M. Electric plug with snap-fitted housing components. 4,679,877, Cl. 439-425.000.

Ahs, Bjorn, to Kamyr AB. Screening device. 4,680,108, Cl. 209-273.000.

Aikawa, Hiroshi: *See—*
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.

Ainsworth, Kenneth M.: *See—*
Baker, Daniel G.; and Ainsworth, Kenneth M., 4,680,620, Cl. 358-10.000.

Air Products and Chamicals, Inc.: *See—*
Marsella, John A., 4,680,393, Cl. 544-170.000.

Air Products and Chemicals, Inc.: *See—*
Ramprasad, Dorai; and Busch, Daryle H., 4,680,037, Cl. 55-16.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Okamura, Masayuki, 4,679,440, Cl. 73-118.100.

Aisin Seiki Kabushiki Kaisha: *See—*
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.
Nishikawa, Masumi; and Ishikawa, Masanobu, 4,679,457, Cl. 74-441.000.

Aisin-Warner Limited: *See—*
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.

Ajinomoto Co., Inc.: *See—*
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.
Iwai, Kazuo, 4,680,313, Cl. 514-627.000.

Akademiet for de Tekniske Videnskaber, Svejsecentralen: *See—*
Lund, Svend, 4,679,448, Cl. 73-866.500.

Akers, Paul J.: *See—*
Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., 4,680,335, Cl. 524-501.000.

Akiyama, Tadahiko; and Otsuka, Yoshio, to Nippo Communication Industrial Co., Ltd. Personal-signaling communication system. 4,680,785, Cl. 379-57.000.

Akutsu, Eiichi: *See—*
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, 4,680,235, Cl. 428-414.400.

Akzo nv: *See—*
Klugar, Karl; and Van Santvoort, Gerardus P. T. M., 4,679,731, Cl. 238-2.000.
Weidenhaupt, Wolfgang; and Dismon, Peter, 4,679,387, Cl. 57-212.000.

Aladdin Engineering & Mfg: *See—*
Horn, Edward R.; and Kot, Norbert J., II, 4,679,782, Cl. 269-228.000.

Albrecht, Klaus: *See—*
Liebler, Ralf; and Albrecht, Klaus, 4,680,359, Cl. 526-309.000.

Alcor, Inc.: *See—*
Orlando, Thomas W., 4,680,167, Cl. 422-199.000.

Alesson, Thomas, to Nicholson Division, Datron Systems, Inc. Thermostatic steam trap with self-centering valve. 4,679,727, Cl. 236-56.000.

Allaire, Eugene J. Bottle top. 4,679,697, Cl. 215-295.000.

Allard, Andre, to Beloit Corporation. Heated variable crown roll. 4,679,287, Cl. 29-116.0AD.

Allegheny Ludlum Corporation: *See—*
Shen, Tien-Hung; and Salsgiver, James A., 4,680,062, Cl. 148-111.000.

Allen-Bradley Company: *See—*
Kerkman, Russel J.; and Rowan, Timothy M., 4,680,695, Cl. 363-160.000.

Allen, Henry V.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.

Allen, Mark L. High security cylinder lock. 4,679,418, Cl. 70-380.000.

Allied Corporation: *See—*
Bobbio, Stephen M., 4,680,087, Cl. 156-643.000.

Bonfield, John H., 4,680,394, Cl. 544-193.000.
Brown, George E., 4,679,994, Cl. 417-525.000.
Kosarski, Raymond, Jr.; and Jackson, Robert W., 4,679,397, Cl. 60-562.000.
Lakhani, Amir A.; and Olver, Laurence C., 4,679,311, Cl. 29-579.000.
Malka, Jacob H.; and Osetec, Marc, 4,680,726, Cl. 364-721.000.
Morgan, Thomas R., 4,680,169, Cl. 423-53.000.
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6.00C.
Wilson, Robert K., 4,679,491, Cl. 91-369.00A.

Allis-Chalmers Corporation: *See—*
Revell, Alan E., 4,680,039, Cl. 55-341.00R.

Alonso, Manuel T., to Tascon Medical Technology Corporation. Heart valve prosthesis. 4,680,031, Cl. 623-2.000.

Alonso, Sydney A., to New England Digital Corporation. Method of and apparatus for providing pulse trains whose frequency is variable in small increments and whose period, at each frequency, is substantially constant from pulse to pulse. 4,680,479, Cl. 307-265.000.

Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, to Rhone-Poulenc Sante. Thioformamide derivatives and use in inhibiting gastric secretion. 4,680,303, Cl. 514-336.000.

Alpen Dairy Foods Pty. Limited: *See—*
Kilroy, Stanley A. R., 4,680,194, Cl. 426-602.000.

Alps Electric Co., Ltd.: *See—*
Fujioka, Kazunori, 4,680,517, Cl. 318-332.000.
Sugawara, Katsuyuki, 4,680,655, Cl. 360-97.000.

Alroy, Yoram A.: *See—*
Stanley, Smith B.; and Alroy, Yoram A., 4,679,261, Cl. 5-183.000.

Alsenz, Richard H. Temperature responsive compressor pressure control apparatus and method. 4,679,404, Cl. 62-175.000.

Alsthom: *See—*
Rodriguez, Francis; and Roblin, Jean-Paul, 4,679,824, Cl. 285-27.000.

Alsthom-Atlantique, S.A.: *See—*
Anton, Alain, 4,680,222, Cl. 428-251.000.

Altizor, C. Clark: *See—*
Schultz, Roy D.; England, Thomas R.; and Altizor, C. Clark, 4,679,313, Cl. 29-596.000.

Altman, Peter, to Light and Sound Specialties, Inc. Light panel. 4,680,685, Cl. 362-240.000.

Altmann, Josef; and Beran, Bohuslav, to ZLEHIT pri BAN. Apparatus for the continuous vacuum cleaning of oil. 4,680,091, Cl. 202-205.000.

Aluminum Company of America: *See—*
Hawkins, Ronald G., 4,680,424, Cl. 174-42.000.

Aluminum Ladder Company: *See—*
Bennett, Ronald W.; and MacDonald, Ellie H., 4,679,657, Cl. 182-113.000.

Amada Company, Limited: *See—*
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157.000.

Amada Engineering Service Co., Inc.: *See—*
Koseki, Ryoji, 4,680,771, Cl. 372-107.000.

Amazawa, Kiyoshi: *See—*
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12.000.

Ambasz, Emilio. Flexible pen with sliding sleeve. 4,679,954, Cl. 401-117.000.

Ambos, Hans D.; Cain, Michael E.; and Sobel, Burton E., to Washington University. Method and apparatus for analyzing electrocardiographic signals. 4,680,708, Cl. 364-417.000.

Amdahl Corporation: *See—*
Price, John E.; and De Clue, Larry W., 4,680,486, Cl. 307-475.000.

American Cyanamid Company: *See—*
Morin, Louis G., 4,680,093, Cl. 204-28.000.
Morin, Louis G., 4,680,100, Cl. 204-228.000.
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,680,293, Cl. 514-243.000.

American District Telegraph Company: *See—*
Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., 4,679,881, Cl. 439-392.000.

American Standard Inc.: *See—*
Pearse, Richard H., Jr., 4,679,411, Cl. 62-519.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Dyer, Christopher K., 4,680,241, Cl. 429-49.000.
Fineblum, Solomon S., 4,679,890, Cl. 439-884.000.
Hanlon, James T.; and Renaut, Paul W., 4,680,563, Cl. 335-58.000.
Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., 4,680,084, Cl. 156-626.000.

American Telephone and Telegraph Company, AT&T Bell Labs: *See—*
Swartz, Robert G., 4,680,810, Cl. 455-609.000.

American Tourister, Inc.: *See—*
Wickman, John A., 4,679,670, Cl. 190-18.00A.

Amerock Corporation: *See—*
Bates, Wayne C., 4,679,352, Cl. 49-192.000.

Amoco Corporation: *See—*
Chang, Yuehsiung, 4,680,098, Cl. 204-182.400.

Amor, Bernard: *See—*
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierrc; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

AMP Incorporated: *See—*
Assini, John E.; and Kissinger, Paula A., 4,679,883, Cl. 439-607.000.
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.
Bright, Edward J., 4,679,318, Cl. 79-840.000.
Corrao, Mark; and Shaffer, David T., 4,680,568, Cl. 337-186.000.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,679,319, Cl. 29-843.000.
Huber, John H., 4,679,895, Cl. 350-96.200.
Jackson, Charles L., 4,679,887, Cl. 439-849.000.
Regla, Juan; and Lazaro, Jose, 4,679,876, Cl. 439-426.000.
Williams, Tom R., 4,679,888, Cl. 439-883.000.

Amsted Industries Incorporated: *See—*
Sieradzki, Christopher; and Jeffreys, Lyman W., 4,679,447, Cl. 73-865.800.
Sieradzki, Christopher Z., 4,679,358, Cl. 51-165.720.

Amundson, Anthony P., to Microcom, Inc. Data telecommunications system and method utilizing a multi-mode modem. 4,680,773, Cl. 375-8.000.

Amundson, Anthony P.; and Melhorn, Nathan, to Microcom, Inc. Data telecommunications system and method with universal link establishment. 4,680,781, Cl. 375-8.000.

Analogic Corporation: *See—*
Neumann, Leopold, 4,680,798, Cl. 381-68.400.

Andeen, Bruce R., to Helix Technology Corporation. Cooling heat exchanger. 4,679,402. Cl. 62-55.500.

Anderson, Paul T.; and Irwin, Lawrence, to Babcock & Wilcox Company, The. Vacuum sealing device for insulated steam injection tubing. 4,679,378, Cl. 53-405.000.

Andersson, Kjell, to Seco Tools AB. Device in rotary tools. 4,679,972, Cl. 408-150.000.

Ando, Toshio: *See—*
Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, 4,680,218, Cl. 428-195.000.

Andoh, Shizuo: *See—*
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.

Andrade, Juan; and Prescher, Gunter, to Degussa Aktiengesellschaft. Process for the producing 2,5-dimethoxytetrahydrofuran and 2,5-diethoxytetrahydrofuran. 4,680,420, Cl. 549-476.000.

Andros Analyzers Incorporated: *See—*
Parnoff, George K.; and Sultan, Steven L., 4,679,573, Cl. 128-716.000.

Andrulis Research Corporation: *See—*
Schwartz, Paul; Gill, Devinder S.; and McGrath, Kenneth J., 4,680,308, Cl. 514-492.000.

Angelety, Albert, Sr. Fishing apparatus. 4,679,346, Cl. 43-20.000.

Annulus Technical Industries, Inc.: *See—*
MacAdam, Donald H., 4,680,433, Cl. 200-16.00D.

Antezana, Luis F., to Nicholson Manufacturing Corporation. Log-bundling and cutoff apparatus. 4,679,475, Cl. 83-420.000.

Anthony, James R.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Remote harness web adjuster. 4,679,852, Cl. 297-464.000.

Anthony, Jean M., to Tomtec, N.V. Device for performing therapeutic treatments. 4,679,551, Cl. 128-67.000.

Anton, Alain, to Alsthom-Atlantique, S.A. Process and device for electric winding insulation by impregnation, and stabilized varnish without solvent usable therein. 4,680,222, Cl. 428-251.000.

Aoi, Kazuo; and Tsuchida, Naoki, to Yamaha Hatsudoki Kabushiki Kaisha. Valve arrangement for internal combustion engine. 4,679,532, Cl. 123-90.220.

Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, to Nissei ASB Machine Co., Ltd. Biaxially oriented plastic container with excellent heat-resistance and gas barrier properties. 4,680,208, Cl. 428-35.000.

Aoki, Hatsuo: *See—*
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.

Aoki, Kazuo: *See—*
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.

Aoki, Motohisa; and Iwanaga, Hironobu, to Mitsubishi Chemical Industries Limited. Method for producing an electrophotographic element. 4,680,246, Cl. 430-133.000.

Aoki, Takao: *See—*
Ikeda, Yoshinori; and Aoki, Takao, 4,680,646, Cl. 358-298.000.

Aosai, Fumito: *See—*
Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.

Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, to Mitsubishi Chemical Industries Ltd. Fire-retarding resin composition and laminated product thereof. 4,680,227, Cl. 428-331.000.

Applezweig, Norman, to Progenics, Inc. Treatment of obesity and diabetes using sapogenins. 4,680,289, Cl. 514-172.000.

Application Engineering Corporation: *See—*
Waters, Michael A., 4,680,001, Cl. 425-144.000.

Applied Medical Technics B.V.: *See—*
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1.00R.

Ara, Masato: *See—*
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.

Arad, Abraham A.: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,680,020, Cl. 446-414.000.

Araki, Shigeru: *See*—
Kato, Hideaki; and Araki, Shigeru, 4,680,791, Cl. 380-8.000.

Araki, Yoshitsugu. Optical parts driving mechanism in optical information reader. 4,680,743, Cl. 369-44.000.

Aral, Gurcan; and Balakrishnan, Ramesh, to Measurex Corporation. Process for controlling the formation of sheet material. 4,680,089, Cl. 162-198.000.

Arbisi, Dominic S.; and Replogle, Coy E., to Aeras Water Resources, Inc. Mobile pond aerating system. 4,680,148, Cl. 261-120.000.

Archer, Virgil L.: *See*—
Smith, Donald P.; and Archer, Virgil L., 4,679,542, Cl. 126-21.00A.

Arima, Yoshitaka: *See*—
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157.000.

Arimitsu, Satoshi: *See*—
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.

Arimune, Hisao: *See*—
Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,680,742, Cl. 369-13.000.

Arnott, Robert C., to Milliken Research Corporation. Process for heat treating textile substrates to give a colored pattern. 4,680,032, Cl. 8-486.000.

Arnott, Robert C., to Milliken Research Corporation. High contrast patterning process and product for disperse dyed polyester. 4,680,034, Cl. 8-481.000.

Arsenian, Sergei G.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Artz, Gerd; Figge, Dieter; and Philipp, Clemens, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Guide assembly for a twin-belt continuous casting mold. 4,679,612, Cl. 164-431.000.

Artzt, Peter; Rottmayr, Hans; and Bauer, Wolfgang, to Schubert & Salzer. Process and apparatus for friction spinning. 4,679,388, Cl. 57-263.000.

Aruga, Tamotsu: *See*—
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, 4,680,235, Cl. 428-414.400.

Asada, Masahiro; and Azuma, Miyuki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for isolating polymer. 4,680,381, Cl. 528-501.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, 4,679,718, Cl. 225-48.000.

Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, to Toyo Soda Manufacturing Co., Ltd. Method of polymerizing vinyl monomers with coated reactor. 4,680,349, Cl. 526-62.000.

Asaka, Toshifumi: *See*—
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.

Asano, Shuichi: *See*—
Yamamoto, Kazuo; and Asano, Shuichi, 4,679,821, Cl. 280-808.000.

Asano, Toru: *See*—
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.

Asano, Yoshikatsu: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.

Asbill, Clarence M., III: *See*—
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84.000.

Ashida, Kaneyoshi: *See*—
Frisch, Kurt C.; and Ashida, Kaneyoshi, 4,680,214, Cl. 428-107.000.

Assini, John E.; and Kissinger, Paula A., to AMP Incorporated. Shoulder eyelet board lock. 4,679,883, Cl. 439-607.000.

Associated Mechanical Contractors, Inc.: *See*—
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.

Astra Plastique: *See*—
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.

AT&T Company: *See*—
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.

AT&T Information Systems Inc.: *See*—
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.

Atlantic Richfield Company: *See*—
Perkins, Thomas K., 4,679,626, Cl. 166-248.000.

Aubert, Paul: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,679,988, Cl. 417-218.000.

Aufiero, James M.: *See*—
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111.000.

Auger, Genevieve: *See*—
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Aurora Mechatronecs Corp.: *See*—
Kuo, Calven, 4,680,455, Cl. 235-146.000.

Autoliv Development AB: *See*—
Emanuelson, Bjorn, 4,679,853, Cl. 297-468.000.

Automated Packaging Systems, Inc.: *See*—
Lerner, Hershey; and Lerner, Bernard, 4,680,205, Cl. 428-29.000.

Automatic Switch Company: *See*—
Vollmer, David J.; and Greame, James E., 4,679,767, Cl. 251-129.150.

Automobiles Citroen: *See*—
Taunay, Claude, 4,679,841, Cl. 296-76.000.

Automobiles Peugeot: *See*—
Taunay, Claude, 4,679,841, Cl. 296-76.000.

AVX Corporation: *See*—
Chan, Ning-Huat, 4,680,670, Cl. 361-275.000.

Axelrod, Robert J.; and Cooper, Glenn D., deceased (Cooper, executrix; by Rose H.), to General Electric Company. Flame resistant alkenyl aromatic compounds and polymers containing chemically bonded phosphorus and blends with polyphenylene ether. 4,680,342, Cl. 525-132.000.

Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., to EMI Limited. Helical antenna array with resonant cavity and impedance matching means. 4,680,591, Cl. 343-853.000.

Azuma, Miyuki: *See*—
Asada, Masahiro; and Azuma, Miyuki, 4,680,381, Cl. 528-501.000.

B. F. Goodrich Company, The: *See*—
Benedikt, George M.; and Barnes, Dennis A., 4,680,380, Cl. 528-485.000.
Kramer, James H., 4,679,517, Cl. 114-45.000.
Lee, Biing-lin, 4,680,343, Cl. 525-148.000.
Yu, Simon H., 4,680,358, Cl. 526-292.900.

B & J Rocket Rasp A/S: *See*—
Holst, Svend; Jensen, Niels; and Jensen, Georg, 4,679,354, Cl. 51-76.00R.

Baba, Fumio; and Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device. 4,680,734, Cl. 365-190.000.

Baba, Takeshi: *See*—
Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, 4,679,931, Cl. 355-56.000.

Babcock & Wilcox Company, The: *See*—
Anderson, Paul T.; and Irwin, Lawrence, 4,679,378, Cl. 53-405.000.
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861.240.

Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, to Institut National de la Sante et de la Recherche Medicale. Metal polypeptides. 4,680,276, Cl. 436-542.000.

Bach, Lloyd G.: *See*—
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6.00C.

Back, Gerhard, to Ciba-Geigy Corporation. Metal dye complexes containing an azo or azomethine dye and a colorless ligand with the C═N—N═C group. 4,680,385, Cl. 534-695.000.

Baerenwald, Philip M.; and Reed, Phillip G., to Kenner Parker Toys Inc. Toy figure with individually posable limbs. 4,680,019, Cl. 446-378.000.

Baffi, Robert A.: *See*—
Wagner, Daniel B.; and Baffi, Robert A., 4,680,275, Cl. 436-518.000.

Baggen, Constant P. M. J.: *See*—
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.

Bailey, Louis G.: *See*—
Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617.000.

Bailleul, Gilles; and Sannes, Tjerk, to U.S. Philips Corporation. Screened cable insulated by means of mineral insulation material and method of manufacturing such a cable. 4,679,317, Cl. 29-828.000.

Bain, James M.: *See*—
Vanderpool, James L.; and Bain, James M., 4,680,078, Cl. 156-352.000.

Baits, Stephen S.; and Reynolds, Richard W., to Sundstrand Corporation. Differential transmission mechanism for a constant speed drive. 4,679,462, Cl. 74-687.000.

Baker, Daniel G.; and Ainsworth, Kenneth M., to Tektronix, Inc. Measurement of SC/H phase using a subcarrier time mark generator and a calibrated phase shifter. 4,680,620, Cl. 358-10.000.

Baker, Daniel G.; and Feisel, Magaret A., to Tektronix, Inc. Method and apparatus for variable phasing of periodic signals. 4,680,621, Cl. 358-19.000.

Baker, Richard H.; and Maddox, Edward L., to Gould Inc. MOSFET AC switch. 4,680,490, Cl. 307-575.000.

Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., to AT&T Company; and AT&T Information Systems Inc. Communication system for providing business communication features to cellular mobile telecommunication customers. 4,680,786, Cl. 379-60.000.

Baker, Ross G., Jr., to Intermedics, Inc. Low threshold cardiac pacing electrodes. 4,679,572, Cl. 128-786.000.

Balakrishnan, Ramesh: *See*—
Aral, Gurcan; and Balakrishnan, Ramesh, 4,680,089, Cl. 162-198.000.

Ball Corporation: *See—*
Doud, Wilbur O., 4,680,050, Cl. 65-79.000.
Wertz, Ronald D.; Orszulak, James H.; and Sweeney, Christopher L., 4,680,599, Cl. 340-744.000.

Ballantyne, David B., to General Motors Corporation. Method of making a lubricated hinge pin. 4,679,285, Cl. 29-11.000.

Ballentine, Paul H., to Carrier Corporation. Method and apparatus for measuring the pore size of enhanced tubes. 4,679,423, Cl. 73-37.500.

Balmer, Oskar: *See—*
Focke, Heinz; and Balmer, Oskar, 4,680,024, Cl. 493-197.000.

Banaszewski, Sharon L.: *See—*
Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., 4,680,709, Cl. 364-414.000.

Bank, Graham; Scaife, Stephen; and Millward, Gareth, to Wharfedale Loudspeaker Limited. Moving-coil loudspeaker unit. 4,680,800, Cl. 381-194.000.

Banta, Maynard A. Plant growing shelter. 4,679,350, Cl. 47-29.000.

Banzai, Hideo: *See—*
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, 4,680,151, Cl. 264-40.300.

Barajas, Felix, to McDonnell Douglas Corporation. Solder composition. 4,680,141, Cl. 252-512.000.

Baranov, Alexandr I.: *See—*
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Barber, William D.: *See—*
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Barbiaux, William J.; and Wineinger, Eugene L., to Motorola, Inc. Meter drive inhibit circuit. 4,680,541, Cl. 324-128.000.

Bard, John K., to Hercules Incorporated. Multiphase epoxy thermosets having rubber within disperse phase. 4,680,076, Cl. 156-306.900.

Barker, Peter L.: *See—*
Firestone, Raymond A.; and Barker, Peter L., 4,680,391, Cl. 540-355.000.

Barlet, Loren E. Shielding arrangement and method for TIG. 4,680,440, Cl. 219-75.000.

Barnes, Dennis A.: *See—*
Benedikt, George M.; and Barnes, Dennis A., 4,680,380, Cl. 528-485.000.

Barnes, Lawrence C.; and Mankedick, Robert G., to NCR Corporation. Apparatus and method for mixing video signals for simultaneous presentation. 4,680,622, Cl. 358-22.000.

Barnes, Richard J.: *See—*
Krafcik, Joseph T.; Barnes, Richard J.; and Goetter, Erwin H., 4,679,896, Cl. 350-96.200.

Barone, David, to Organon Teknika Corporation. Ultrafiltration control for hemodialysis. 4,680,122, Cl. 210-637.000.

Barr, John D.; and Wardley, Michael T., to NL Petroleum Products Limited. Rotary drill bits and cutting elements for such bits. 4,679,639, Cl. 175-329.000.

Barree, Robert D., to Marathon Oil Company. Automated gas-liquid relative permeameter. 4,679,421, Cl. 73-38.000.

Barsony, Istvan, to Research Development Corporation of Japan. Method of manufacturing a recessed gate of a semiconductor device. 4,679,307, Cl. 29-576.00B.

Barta nee Bukovecz, Margit: *See—*
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Bartlett, Allen J.: *See—*
Lessard, Philip A.; Bartlett, Allen J.; and Peterson, John F., 4,679,401, Cl. 62-55.500.

Bartscher, Peter: *See—*
Ulrich, Helmut; Bartscher, Peter; and Shilton, Brian, 4,679,865, Cl. 303-52.000.

BASF Aktiengesellschaft: *See—*
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,680,412, Cl. 548-480.000.
Hettche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, 4,680,327, Cl. 524-110.000.
Hibst, Hartmut, 4,680,130, Cl. 252-62.600.
Kranz, Joachim, 4,680,387, Cl. 540-136.000.
Manzke, Klaus; Schneider, Richard; and Kohl, Lambert, 4,680,656, Cl. 360-98.000.

BASF Corporation, Inmont Division: *See—*
Hays, Byron G., 4,680,057, Cl. 106-23.000.

Basol, Bulent M., to Sohio Commercial Development Co. Multilayer ohmic contact for p-type semiconductor and method of making same. 4,680,611, Cl. 357-71.000.

Bassett, Alvin L. Router table. 4,679,606, Cl. 144-134.00A.

Bastanzuri, Remberto P., to Scheck, Michael, a part interest. Process for removing ink particles from paper products. 4,680,088, Cl. 162-4.000.

Bateman, Frank E. Thermally protective drapery construction for windows, sliding glass doors, glass wall panels and the like. 4,679,609, Cl. 160-124.000.

Bates, Peter C.: *See—*
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Bates, Wayne C., to Amerock Corporation. Hardware for mounting a window sash. 4,679,352, Cl. 49-192.000.

Bauer, Frederick T., to Gentex Corporation. Photoelectric smoke detector and alarm system. 4,680,576, Cl. 340-630.000.

Bauer, John K. Ball joint safety system. 4,679,957, Cl. 403-27.000.

Bauer, Theodore J.; Herke, Donald P.; Bork, Edward A.; and Lawson, William E., to Laser Machining, Inc. Apparatus for cutting multiple layers of fabric. 4,680,442, Cl. 219-121.0LG.

Bauer, Wolfgang: *See—*
Artzt, Peter; Rottmayr, Hans; and Bauer, Wolfgang, 4,679,388, Cl. 57-263.000.

Bauman, Jack. Fluid submersible laryngoscope. 4,679,547, Cl. 128-10.000.

Baxter Travenol Laboratories, Inc.: *See—*
Kamen, Dean L., 4,680,462, Cl. 250-222.100.
Kruger, Robert J.; and Brown, Richard I., 4,680,025, Cl. 604-6.000.
Sheehan, Neil J.; Oppenlander, Jon E.; and Fleenor, Richard P., 4,679,446, Cl. 73-864.130.

Bayer Aktiengesellschaft: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Roif; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Grohe, Klaus, 4,680,401, Cl. 546-153.000.
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.
Schulte, Klaus; and Ersfeld, Heinrich, 4,680,003, Cl. 425-206.000.
Skipka, Guido; and Durholz, Friedrich, 4,680,146, Cl. 260-505.00R.
Wehinger, Egbert; and Towart, Robertson, 4,680,305, Cl. 514-347.000.

Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., to General Motors Corporation. Hard bar bumper for vehicles. 4,679,837, Cl. 293-102.000.

Bazzi, Ali A.: *See—*
Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., 4,680,325, Cl. 524-101.000.

BBC Brown, Boveri & Company, Limited: *See—*
Hellat, Jaan; and Keller, Jakob, 4,679,393, Cl. 60-39.450.
Rey, Antoine; and Stemmler, Herbert, 4,680,531, Cl. 323-206.000.

Beal, Loren D. Clamp chuck. 4,679,802, Cl. 279-106.000.

Beare, Eric: *See—*
Fisherman, Carl; and Beare, Eric, 4,680,681, Cl. 362-98.000.

Becka, Michael M.; and Vornberger, Walter, to International Shoe Machine Corporation. Heel lasting machine. 4,679,269, Cl. 12-10.500.

Becor Western Inc.: *See—*
Jasinski, Richard A.; and Mains, Donald M., 4,679,489, Cl. 91-36.000.

Becton, Dickinson and Company: *See—*
Frankel, Eric; and Plucinski, Andrzej J., 4,679,571, Cl. 128-764.000.
Wagner, Daniel B.; and Baffi, Robert A., 4,680,275, Cl. 436-518.000.

Bedder, Stephen W.: *See—*
Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., 4,680,335, Cl. 524-501.000.

Beers, Melvin D., to General Electric Company. One component silicone compositions with good bonding properties. 4,680,363, Cl. 528-14.000.

Behring, Daniel F. Convertible stand. 4,679,655, Cl. 182-33.000.

Beilin Solomon I.; and Truong, Long K., to EPID. Inc. Positive particles in electrophoretic display device composition. 4,680,103, Cl. 204-299.00R.

Beitinger, Eberhard: *See—*
Glaser, Eberhard; and Beitinger, Eberhard, 4,679,965, Cl. 405-258.000.

Belkin, Nathan L., to Superior Surgical Mfg. Co., Inc. Anti-static device. 4,680,668, Cl. 361-220.000.

Bell Communications Research, Inc.: *See—*
Miller, Stewart E., 4,680,769, Cl. 372-50.000.

Bell & Howell Company: *See—*
Westover, Dwight G., 4,679,905, Cl. 350-255.000.

Bell, William E.; and Collins, George J., to Lasertechnics, Inc. Dual beam gas ion laser. 4,680,770, Cl. 372-99.000.

Bellamy, Francois: *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.

Beloit Corporation: *See—*
Allard, Andre, 4,679,287, Cl. 29-116.0AD.

Beltran, Adrian M.: *See—*
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,679,314, Cl. 29-598.000.

Belyaev, Sergei V.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Benchimol, Claude: *See—*
Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, 4,680,782, Cl. 378-4.000.

Bendix Limited: *See—*
Fogg, Stephen W., 4,679,594, Cl. 137-627.500.

Benedikt, George M.; and Barnes, Dennis A., to B. F. Goodrich Company, The. Odor-free chlorosulfonated polyolefins. 4,680,380, Cl. 528-485.000.

Benenati, Robert L.; and Moy, Wayne K., to Motorola, Inc. Electrical battery including apparatus for current sensing. 4,680,527, Cl. 320-2.000.

Benest, Glenn: *See—*
Sherin, Alan; Geagley, Bradley; and Benest, Glenn, 4,679,797, Cl. 273-251.000.

Bengtsson, Lars; and Sjolander, Johan, to Gotaverken Arendal AB. Remotely controlled riser connection. 4,679,632, Cl. 166-345.000.

Benke, George, to United States of America, Air Force. Secure digital speech communication. 4,680,797, Cl. 381-41.000.

Bennett, Brian A. Rotary nibbler. 4,679,323, Cl. 30-240.000.

Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., to AMP Incorporated. High performance flat cable. 4,680,423, Cl. 174-36.000.

Bennett, Ronald W.; and MacDonald, Ellie H., to Aluminum Ladder Company. Mobile tank vehicle access system. 4,679,657, Cl. 182-113.000.

Bensing, Gregory L.: *See—*
Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., 4,679,885, Cl. 439-620.000.

Benson, Inc.: *See—*
Deering, Michael F.; and Collins, Galen, 4,680,626, Cl. 358-80.000.

Beran, Bohuslav: *See—*
Altmann, Josef; and Beran, Bohuslav, 4,680,091, Cl. 202-205.000.

Bercorit & Herweg Limited: *See—*
Hardy, Derrick, 4,679,768, Cl. 251-159.000.

Berger, Jean L.; Brissot, Louis; and Cazaux, Yves, to Thomson-CSF. Photosensitive row transfer device provided with negative feedback amplifiers. 4,680,476, Cl. 250-578.000.

Beringer-Hydraulik GmbH: *See—*
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,679,586, Cl. 137-491.000.

Berlese, Remo. Vented bicycle shoe. 4,679,335, Cl. 36-131.000.

Berman, Lou: *See—*
Lund, Walter; Berman, Lou; and Dothan, Felix, 4,679,570, Cl. 128-715.000.

Bernadsky, Vsevolod N.: *See—*
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Bernardot, Christian, to Permaswage S.A. Connecting device for pipings, pipes and conduits. 4,679,828, Cl. 285-175.000.

Bernhard, Ragnar, to Stora Kopparbergs Bergslags AB. Method for preparing compositions which can be used in the production of sodium dithionite; and the use of such compositions. 4,680,136, Cl. 252-188.200.

Berns, Antonius J. M.; and Gielkens, Arnold L. J., to Centraal Diergeneeskundig Instituut. Deletion mutant of a herpesvirus and vaccine containing said virus. 4,680,176, Cl. 424-89.000.

Berrier, Bernard; and Thiersault, Jean P., to BP Chemicals Limited. Stretchable cling film composition based on polyethylene. 4,680,330, Cl. 524-230.000.

Berschauer, Friedrich: *See—*
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.

Bertus, Brent J.: *See—*
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,680,105, Cl. 208-251.00H.

Bethlehem Steel Corp.: *See—*
Lawrence, Craig J.; and Ferriola, John J., 4,679,774, Cl. 266-246.000.

Betts, Joseph E.; and Holub, Fred F., to General Electric Company. Flame-resistant hydrocarbon polymer compounds, and insulated electrical products thereof. 4,680,229, Cl. 428-389.000.

Betz Laboratories, Inc.: *See—*
Edmondson, James G., 4,680,127, Cl. 210-749.000.
Forester, David R.; and Reid, Dwight K., 4,680,421, Cl. 585-648.000.

Beyer, Klaus D.; and Silvestri, Victor J. Planar void free isolation structure. 4,680,614, Cl. 357-50.000.

Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, to EGYT Gyogyszervegyeszeti Gyar. Powder mixture having high propylene glycol content and process for the preparation thereof. 4,680,315, Cl. 514-738.000.

BF Goodrich Company, The: *See—*
Myers, Ronald E.; and Buhks, Ephraim, 4,680,236, Cl. 428-515.000.

Bhatt, Kiran M.: *See—*
Ramachandra, Govardhan; and Bhatt, Kiran M., 4,679,310, Cl. 29-577.00R.

Bianchi, Francois; Busa, Denis; and Fourrey, Francois, to Cycles Peugeot. Device for fixing a headrest on a vehicle seat structure. 4,679,850, Cl. 297-410.000.

BICC Public Limited Company: *See—*
Driskel, Stephen P., 4,679,897, Cl. 350-96.230.
Seddon, Alan E.; and Doughty, John, 4,679,672, Cl. 191-41.000.

Bickle, Wolfgang: *See—*
Creydt, Martin; Bickle, Wolfgang; and Pfestorf, Harald, 4,679,681, Cl. 192-107.00M.

Bihl, Paul R.: *See—*
Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., 4,679,616, Cl. 165-43.000.

Biletch, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., to Polysar Financial Services S.A. Transparent impact polymers. 4,680,337, Cl. 525-53.000.

Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Apparatus for maintaining stability of mobile land vehicles on sloping terrain. 4,679,803, Cl. 280-6.00H.

Billon, Michel: *See—*
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.

Binet, Jean: *See—*
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,680,296, Cl. 514-259.000.

Birchfield, Conny. Fish line sinker. 4,679,349, Cl. 43-44.970.

Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione-5-isoquinoline derivatives. 4,680,400, Cl. 546-141.000.

Birmingham, Virginia A.; and Seno, Eugene T., to Eli Lilly and Company. Method of selecting recombinant DNA-containing streptomyces. 4,680,265, Cl. 435-172.300.

Bither, Peter G., to Hercules Incorporated. Fibrous inner web for sheet vinyl flooring goods. 4,680,223, Cl. 428-280.000.

Bixler, Craig A.: *See—*
Triner, Irvin R.; and Bixler, Craig A., 4,679,879, Cl. 439-425.000.

Blackmer, David E.; and Townsend, James H., Jr., to Kintek, Inc. Sound encoding system. 4,680,796, Cl. 381-23.000.

Blake, Joseph W., III. Multi-message phonograph system. 4,680,747, Cl. 369-65.000.

Blake, William S., to Realex Corporation. Unit dose liquid dispenser. 4,679,714, Cl. 222-449.000.

Blanchard, Gilbert; and Prigent, Michel, to Pro-Catalyse. Pollution control catalyst for internal combustion engine exhaust gases and process for producing it. 4,680,282, Cl. 502-304.000.

Blanchard, Pierre; and Cortot, Jean P., to Thomson-Csf. Process for producing silicide or silicon gates for an integrated circuit having elements of the gate-insulator-semiconductor type. 4,679,301, Cl. 29-571.000.

Bland, Timothy J., to Sundstrand Corporation. Gravity insensitive inventory control device for a two-phase flow system. 4,679,980, Cl. 415-24.000.

Blandford, Joseph W., to Seahorse Equipment Corporation. Offshore well support miniplatform. 4,679,964, Cl. 405-216.000.

Blanken, Pieter G.; and van der Zee, Pieter, to U.S. Philips Corporation. Apparatus for reducing beam current measurement errors. 4,680,640, Cl. 358-243.000.

Blanot, Didier: *See—*
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Blau, David A.; and Fish, William R., to Siegen Corporation. Physiological potential preamplifier. 4,679,568, Cl. 128-696.000.

Blessinger, Kurt V., to Eastman Kodak Company. Timing signal dropout compensation circuit. 4,680,651, Cl. 360-38.100.

Blidschun, Benno; and Lierke, Ernst G., to Kolbus GmbH & Co. KG. Process and apparatus for sterilizing containers. 4,680,163, Cl. 422-28.000.

Block, Barry: *See—*
Shimkunas, Alexander R.; and Block, Barry, 4,680,243, Cl. 430-5.000.

Blome, Eugene R., to General Signal Corporation. Processing, shipping and/or storage container for photomasks and/or wafers. 4,679,689, Cl. 206-334.000.

Blomqvist, Ake; and Linick, James. Cannon-launched projectile scanner. 4,679,748, Cl. 244-3.190.

Blumenfeld, John F.; and Bubon, Frank, to Emhart Industries, Inc. Glass forehearth. 4,680,051, Cl. 65-346.000.

Blunden, Donald J., to Thrall Car Manufacturing Company. Vehicle chock block apparatus for railroad car transport of vehicles. 4,679,974, Cl. 410-30.000.

Blyth, Randolph C.; and Ucci, Pompelio A., to Monsanto Company. Stain resistant nylon fibers. 4,680,212, Cl. 428-97.000.

Blythin, David J.; and Watkins, Robert W., to Schering Corporation. Tricyclic positive inotropic agents. 4,680,297, Cl. 514-293.000.

Blythin, David J., to Schering Corporation. Tricyclic anti-allergy and use as anti-inflammatory agents. 4,680,298, Cl. 514-293.000.

Bobbio, Stephen M., to Allied Corporation. Etching of dielectric layers with electrons in the presence of sulfur hexafluoride. 4,680,087, Cl. 156-643.000.

Boberski, William G.: *See—*
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, to Genentech, Inc. Periplasmic protein recovery. 4,680,262, Cl. 435-68.000.

Boddy, Ian; and Gurteen, Shaun, to Britax Wingard Limited. Exterior rearview mirrors for vehicles. 4,679,758, Cl. 248-479.000.

Boeckmann, Eduard F. B., to GTE Communication Systems, Inc. Telephone security violation detection device. 4,680,783, Cl. 379-6.000.

Boehmig, Robert. Building construction method. 4,679,374, Cl. 52-745.000.

Boeing Company, The: *See—*
Burhans, Frank M., 4,679,750, Cl. 244-129.400.
Stanbery, Billy J., 4,680,422, Cl. 136-249.000.

Bogardus, Joseph B.: *See*—
Kaplan, Murray A.; Bogardus, Joseph B.; and Lipper, Robert A., 4,680,389, Cl. 540-222.000.

Bogdanovsky, Valentin A.: *See*—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Boggiano, John. Apparatus and method for processing fava beans having pods and seeds. 4,680,192, Cl. 426-482.000.

Boggs, Ronald M.: *See*—
Lomax, Donald P.; and Boggs, Ronald M., 4,679,294, Cl. 29-460.000.

Boinot, Jean-Claude, to Micro-Mega S.A. Dental contra-angle handpiece with means for illuminating the treatment area. 4,680,011, Cl. 433-29.000.

Bois, Daniel. Process for producing zones for the electrical isolation of the components of an integrated circuit. 4,679,304, Cl. 29-576.00W.

Boit, Jean C.; and Galves, Jean P., to Thomson-CSF. Picture intensifier tube with memorization. 4,680,461, Cl. 250-213.0VT.

Boiti, Franco: *See*—
Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boiti, Franco, 4,679,653, Cl. 182-2.000.

Bolland, Daniel B., to Exxon Research and Engineering Company. Liquid storage tank leak detection system. 4,679,425, Cl. 73-49.200.

Bolza-Schunemann, Claus A., to Koenig & Bauer Aktiengesellschaft. Edge location measuring head. 4,680,806, Cl. 382-65.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,679,384, Cl. 56-13.600.

Bonfield, John H., to Allied Corporation. Method of preparing formaldoxime trimer. 4,680,394, Cl. 544-193.000.

Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, to Societe Generale des Eaux Minerales de Vittel; and Astra Plastique. Container and sealing assembly. 4,679,696, Cl. 215-252.000.

Bonnesen, John S.; and Sporer, Timothy J., to Reliance Comm/Tec Corporation. Gas discharge arrester. 4,680,665, Cl. 361-120.000.

Borel, Joseph, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S. Process for manufacturing isolated semi conductor components in a semi conductor wafer. 4,679,309, Cl. 29-576.00W.

Borg-Warner Automotive, Inc.: *See*—
Devall, Jeffrey E.; and Reinke, Ronald E., 4,679,580, Cl. 137-39.000.
Lech, Thaddeus, Jr.; and Mullard, Bruce A., 4,679,679, Cl. 192-106.200.

Borg-Warner Corporation: *See*—
Fogelberg, Mark J., 4,679,663, Cl. 188-82.100.
Habel, Paul A., Jr.; and Kulczycki, Elaine S., 4,679,678, Cl. 192-106.200.

Bork, Edward A.: *See*—
Bauer, Theodore J.; Herke, Donald P.; Bork, Edward A.; and Lawson, William E., 4,680,442, Cl. 219-121.0LG.

Bos, Johannes: *See*—
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.

Boston University, Trustees of: *See*—
Sengupta, Sisir K., 4,680,382, Cl. 530-317.000.

Botto, Paolo: *See*—
Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, 4,680,340, Cl. 525-72.000.

Bouchard, Claude; and Boulanger, Pierre, to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee. Particle detector. 4,680,468, Cl. 250-310.000.

Bouchaudon, Jean: *See*—
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,680,303, Cl. 514-336.000.

Bouiller, Jean G.; and Jourdain, Gerard E. A., to Societe Nationale d'Etude et de Construction de Moteur d'Aviation "S. N. E. C. M. A.". Compressor blow-off arrangement. 4,679,982, Cl. 415-145.000.

Boulanger, Pierre: *See*—
Bouchard, Claude; and Boulanger, Pierre, 4,680,468, Cl. 250-310.000.

Bourns, Inc.: *See*—
King, William H., 4,679,886, Cl. 439-816.000.

Boutros, Mansour Z. Shipboard transportation simulator and breakbulk cargo table therefor. 4,680,013, Cl. 434-29.000.

Bove, Bertrand, to Advanced Micro Electronic Components and Systems. Capacitive weighing device. 4,679,643, Cl. 177-210.00C.

Bowen, Christine M.: *See*—
Evans, Thomas E.; and Bowen, Christine M., 4,680,211, Cl. 428-65.000.

Box, Clyde O. Trailer suspension system. 4,679,819, Cl. 280-680.000.

BP Chemicals Limited: *See*—
Berrier, Bernard; and Thiersault, Jean P., 4,680,330, Cl. 524-230.000.

Bracht, Roger R., to Optotech, Inc. Single beam direct read during write and write protect system for use in an optical data storage system. 4,680,594, Cl. 346-108.000.

Brackett, John R., Jr. Electrical plug lock. 4,679,873, Cl. 439-134.000.

Bradford, William M.: *See*—
Petratos, Nickie A.; Karl, David; and Bradford, William M., 4,680,676, Cl. 361-424.000.

Bradley, Terry. Log splitter. 4,679,607, Cl. 144-193.00A.

Bradshaw, Kenneth M.: *See*—
Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.

Bragard, Adolphe: *See*—
Monfort, Guy; Crahay, Jean; and Bragard, Adolphe, 4,679,288, Cl. 29-121.800.

Brandenburg, Darrell L., to General Motors Corporation. Anti-glare rear view mirror. 4,679,906, Cl. 350-281.000.

Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, to SKF GmbH. Worm gear. 4,679,458, Cl. 74-458.000.

Bratkowski, Walter V.; and Wafer, John A., to Westinghouse Electric Corp. Integral circuit interrupter with separable modules. 4,680,562, Cl. 335-16.000.

Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Proximity switch in mounting arrangement. 4,680,436, Cl. 200-82.00E.

Bray, Thomas J., to Cooper Industries, Inc. Recloser control with independent memory. 4,680,706, Cl. 364-492.000.

Brazeway, Inc.: *See*—
Miller, Donald E., 4,679,289, Cl. 29-157.00R.

Breese, Douglas E.: *See*—
Simonton, Robert D.; and Breese, Douglas E., 4,680,242, Cl. 429-136.000.

Breier, Alfred: *See*—
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Brems, John H. Weight responsive rotary retardation device. 4,679,666, Cl. 188-290.000.

Bricas, Evangheios: *See*—
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Brichta, Corrado: *See*—
Gimpel, Franco; and Brichta, Corrado, 4,680,319, Cl. 523-210.000.

Bright, Edward J., to AMP Incorporated. Application tool and method for positioning electrical sockets on circuit boards for surface soldering. 4,679,318, Cl. 79-840.000.

Brignall, Nicolas L.: *See*—
St. Clair, John S.; and Brignall, Nicolas L., 4,680,522, Cl. 318-664.000.

Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., to Societe de Verrerie et de Thermometrie. High voltage and high energy storage device and a pulse generator including the application thereof. 4,680,671, Cl. 361-329.000.

Brissot, Louis: *See*—
Berger, Jean L.; Brissot, Louis; and Cazaux, Yves, 4,680,476, Cl. 250-578.000.

Bristol-Myers Company: *See*—
Kaplan, Murray A.; Bogardus, Joseph B.; and Lipper, Robert A., 4,680,389, Cl. 540-222.000.

Bristow, Ian T., to Hobourn-Eaton, Ltd. Variable capacity type pump with damping force on cam ring. 4,679,995, Cl. 418-26.000.

Britax Wingard Limited: *See*—
Boddy, Ian; and Gurteen, Shaun, 4,679,758, Cl. 248-479.000.

British Aerospace PLC: *See*—
Whinray, David T.; and Tilsley, Gwilym J., 4,680,723, Cl. 364-571.000.

British Broadcasting Corporation: *See*—
Childs, Ian, 4,680,638, Cl. 358-214.000.

British Petroleum Company p.l.c., The: *See*—
Jee, Trevor P., 4,679,598, Cl. 138-103.000.

British Postgraduate Medical Federation: *See*—
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.

Broch, Orville V.: *See*—
Frankard, James M.; and Broch, Orville V., 4,680,126, Cl. 210-710.000.

Brock, Marilyn A.; and Scheffer, Daniel G., to Ohaus Scale Corporation. Spring-type adjustable mounting for weighing scale flexures. 4,679,642, Cl. 177-164.000.

Brocklebank, Norman; and Cooper, Alan, to J. C. Bamford Excavators Limited. Earth moving machine. 4,679,336, Cl. 37-103.000.

Brocksieper, Manfred: *See*—
Feller, Otto; Brocksieper, Manfred; and Luckger, Rolf, 4,679,472, Cl. 82-19.000.

Bross, Charles F., to Pennwalt Corporation. Optical detecting system for article counting machine. 4,680,464, Cl. 250-223.00R.

Brother Kogyo Kabushiki Kaisha: *See*—
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.

Brotherton, Thomas W., to Economy Forms Corporation. Concrete form having adjustable curvature and method for producing same. 4,679,763, Cl. 249-189.000.

Brown, Boveri & Cie AG: *See*—
Gotzenbrucker, Oswald; and Popp, Gerhard, 4,680,615, Cl. 357-55.000.

Brown, David M.: *See*—
Kalb, Gerald F.; and Brown, David M., 4,679,669, Cl. 188-375.000.

Brown, George E., to Allied Corporation. Piston vacuum pump. 4,679,994, Cl. 417-525.000.

Brown, Richard I.: *See*—
Kruger, Robert J.; and Brown, Richard I., 4,680,025, Cl. 604-6.000.

Brown, Sterling B.; and McFay, Dennis J., to General Electric Company. Blends of polyphenylene ethers with phosphorus-containing polymers. 4,680,329, Cl. 524-143.000.

Brown, Steven E.: *See—*
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.

Brozat, Kurt: *See—*
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.

Brunaud, Claude: *See—*
Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., 4,680,671, Cl. 361-329.000.

Brunner, Hans A.; and Vaughan, Donald E., to Reynolds Metals Company. Method and apparatus for heat sealing. 4,680,073, Cl. 156-250.000.

Brunswick Corporation: *See—*
Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, 4,679,682, Cl. 192-21.000.

Bryan, James S.; and Meadows, Roger D., to Dayco Products, Inc. Method of making a railroad track insulator unit. 4,679,293, Cl. 29-450.000.

Bryan, James W. Polarized carrier modulation. 4,680,751, Cl. 370-78.000.

Bryant, Stephen M.; and Speir, Donald J., to United States of America, Air Force. Adaptive fast Fourier transform weighting technique to increase small target sensitivity. 4,680,589, Cl. 342-196.000.

Bryson, Charles E., III; and Jones, Douglas L., to Kevex Corporation. Electron spectroscopy system for chemical analysis of electrically isolated specimens. 4,680,467, Cl. 250-305.000.

Bubon, Frank: *See—*
Blumenfeld, John F.; and Bubon, Frank, 4,680,051, Cl. 65-346.000.

Buchardt, Ole, to pHarma-medica a-s. Process for the isolation and purification of podophyllotoxin. 4,680,399, Cl. 546-139.000.

Bucher-Guyer AG: *See—*
Schmid, Alfred, 4,679,601, Cl. 141-4.000.

Buchinger, Robert: *See—*
Remmel, Jochen; and Buchinger, Robert, 4,679,776, Cl. 267-140.100.

Buck, Erik S., to United States of America, Air Force. Integral grid/-cathode for vacuum tubes. 4,680,500, Cl. 313-348.000.

Budan, Victor J.: *See—*
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861.240.

Budd, David L.; and Fowler, David P., to Frito-Lay, Inc. Cross-cut extrusion method. 4,680,191, Cl. 426-439.000.

Budzich, Tadeusz, to Caterpillar Inc. Compensated fluid flow control valve. 4,679,492, Cl. 91-420.000.

Buehler, Henry J.: *See—*
Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., 4,680,325, Cl. 524-101.000.

Buekers, Valere: *See—*
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,680,065, Cl. 156-49.000.

Buhks, Ephraim: *See—*
Myers, Ronald E.; and Buhks, Ephraim, 4,680,236, Cl. 428-515.000.

Buhler, Steven A.: *See—*
Martin, Russel A.; and Buhler, Steven A., 4,680,605, Cl. 357-23.110.

Buick, James M.: *See—*
Morley, Robert A.; and Buick, James M., 4,680,012, Cl. 434-22.000.

Bulmahn, Gerald L. Apparatus for extending the frame of a tractor. 4,679,634, Cl. 172-250.000.

Bunge, Richard H.: *See—*
Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., 4,680,416, Cl. 549-292.000.

Burger, Norman D., to Burger, Norman D.; and Mardesich, Nicholas A., a part interest. Aerosol dispensing system. 4,680,173, Cl. 424-47.000.

Burhans, Frank M., to Boeing Company, The. Latch system. 4,679,750, Cl. 244-129.400.

Burkness, Donald C. Self diagnostic Cyclic Analysis Testing System (CATS) for LSI/VLSI. 4,680,761, Cl. 371-25.000.

Burlington Industries, Inc.: *See—*
Zybko, Walter C.; Wald, William; and McClure, Thomas V., 4,680,209, Cl. 428-35.000.

Burns, William W.: *See—*
Thorn, John E.; and Burns, William W., 4,679,698, Cl. 220-86.00R.

Burton, James A., to Hydril Company. Hawser chain seal assembly. 4,679,800, Cl. 277-34.000.

Busa, Denis: *See—*
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,679,850, Cl. 297-410.000.

Busch, Alfred; and St. Laurent, James C. T. B., to Proctor & Gamble Company, The. Detergent compositions. 4,680,131, Cl. 252-102.000.

Busch, Daryle H.: *See—*
Ramprasad, Dorai; and Busch, Daryle H., 4,680,037, Cl. 55-16.000.

Bushman, Matthew J.: *See—*
Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., 4,679,364, Cl. 52-173.0DS.

Buss, Waldeen C.: *See—*
Pandey, Sue D.; and Buss, Waldeen C., 4,680,280, Cl. 502-66.000.

Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, to Roquette Freres. Low alcohol beer prepared with hydrogenated starch hydrolyzate. 4,680,180, Cl. 426-16.000.

Butka, Kemal. Ship with stabilizing device. 4,679,521, Cl. 114-124.000.

Byrnes, Donn A. Apparatus for simplifying the launching and retrieval of a boat from its trailer. 4,679,812, Cl. 280-406.00A.

C-I-L Inc.: *See—*
Murray, Charles R., 4,680,207, Cl. 428-35.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,679,384, Cl. 56-13.600.

Cain, Gary L.: *See—*
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.

Cain, Michael E.: *See—*
Ambos, Hans D.; Cain, Michael E.; and Sobel, Burton E., 4,680,708, Cl. 364-417.000.

Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., to Northern Telecom Limited. Structure and fabrication of vertically integrated CMOS logic gates. 4,680,609, Cl. 357-42.000.

Calgon Corporation: *See—*
Cha, Charles Y.; and Varsanik, Richard G., 4,680,135, Cl. 252-180.000.

Camand, Michel: *See—*
Exarque, Jean; and Camand, Michel, 4,680,775, Cl. 375-39.000.

Cameron, Alan B.: *See—*
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Camin, Geary E.; and Uken, William D., to Raychem Corporation. Sealing material. 4,680,233, Cl. 428-424.600.

Camp, Jerald T.: *See—*
Gupta, Ashis S.; and Camp, Jerald T., 4,680,060, Cl. 134-26.000.

Campanella, Ermen: *See—*
Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boiti, Franco, 4,679,653, Cl. 182-2.000.

Campbell, Bruce D.; Triplett, James T.; and Tylor, Richard E., to Raychem Corp. Methods, apparatus and articles for optical fiber systems. 4,679,907, Cl. 350-320.000.

Canadian Hunter Exploration Ltd.: *See—*
Wyman, Richard E., 4,679,630, Cl. 166-305.100.

Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee: *See—*
Bouchard, Claude; and Boulanger, Pierre, 4,680,468, Cl. 250-310.000.

Candle, Richard D., to Goodyear Tire & Rubber Company, The. Method for making rubber articles. 4,680,071, Cl. 156-218.000.

Cannon, Robert B., to Robert B. Cannon, Inc. Take-apart fitting for multi-tube heat exchanger. 4,679,622, Cl. 165-154.000.

Canon Kabushiki Kaisha: *See—*
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,680,696, Cl. 346-75.000.
Ikeda, Yoshinori; and Aoki, Takao, 4,680,646, Cl. 358-298.000.
Itoh, Yuji; and Takahashi, Junichi, 4,679,919, Cl. 351-206.000.
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
Nakazawa, Tamotsu, 4,680,641, Cl. 358-257.000.
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, 4,679,913, Cl. 350-423.000.
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.
Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, 4,679,931, Cl. 355-56.000.
Suematsu, Koshi; and Imai, Eiichi, 4,680,245, Cl. 430-110.000.
Suzuki, Nobuyuki; and Shimizu, Masami, 4,679,926, Cl. 354-173.110.
Takayama, Nobutoshi, 4,680,648, Cl. 360-10.200.
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, 4,680,669, Cl. 361-230.000.

Cantwell, Robert H., to Raytheon Company. Radar system with incremental automatic gain control. 4,680,588, Cl. 342-92.000.

Capelle, Gerd, to Hermann Berstorff Maschinenbau GmbH. Method for monitoring deviations in the dimensions of a continuously extruded profile strip. 4,680,152, Cl. 264-40.400.

Capshew, Charles E.: *See—*
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,680,351, Cl. 526-125.000.

Capuano, Frank G.: *See—*
Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., 4,679,694, Cl. 206-611.000.

Cardiac Pacemakers, Inc.: *See—*
Luksha, Eugene, 4,679,562, Cl. 128-635.000.

Carlemalm, Eric: *See—*
Acetarin, Jean-Dominique; Villiger, Werner; and Carlemalm, Eric, 4,680,362, Cl. 526-320.000.

Carlin Company, The: *See—*
Fisher, Leonard A., 4,680,006, Cl. 431-265.000.

Carlingswitch, Inc.: *See—*
Sorenson, Richard W., 4,680,435, Cl. 200-68.200.

Carlson, Gerald J.: *See—*
Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., 4,680,532, Cl. 323-240.000.
Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.

Carlucci, Vito: *See—*
Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.

Carmine, Benjamin C. Attachment for lawn trimmer. 4,679,385, Cl. 56-16.900.

Carpenter, Richard H., to Commonwealth Technology Incorporated. Helicopter rotor fouling. 4,679,504, Cl. 102-348.000.

Carrier Corporation: *See*—
Ballentine, Paul H., 4,679,423, Cl. 73-37.500.
Mitchell, Charles A.; Wawro, Thaddeus J.; Whipple, Charles E.; and Wright, William E., Sr., 4,679,405, Cl. 62-285.000.

Carrol, Alan, to Trenchbond Limited. Apparatus for the liquid treatment of solids. 4,680,112, Cl. 210-179.000.

Carron, Claude, to Thomson-CGR. Continuous high d.c. voltage supply particularly for an X-ray emitter tube. 4,680,693, Cl. 363-98.000.

Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., to PPG Industries, Inc. Flexible primer composition and method of providing a substrate with a flexible multilayer coating. 4,680,346, Cl. 525-486.000.

Carternock, Frederick A.; and Knackstedt, Jack S., to Drazil, Jaromir Vaclav. Material working machine with vibrating tool carrier. 4,679,337, Cl. 37-118.00R.

Case, Steven K.: *See*—
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., 4,680,704, Cl. 364-525.000.

Casio Computer Co., Ltd.: *See*—
Hirota, Satoshi; and Nagamine, Kimihiro, 4,679,952, Cl. 400-279.000.
Sugiyama, Kazuhiro; and Kawai, Yoshio, 4,680,432, Cl. 200-5.00A.
Sugiyama, Kazuhiro; and Shimazaki, Tatsuo, 4,680,724, Cl. 364-708.000.

Caspari, Richard B., to Chattanooga Corporation. Drape for arthroscopic surgery. 4,679,552, Cl. 128-132.00D.

Cassal, Jean-Marie, to Hoffmann-La Roche Inc. Steroids for the treatment of hypercholesterolemia. 4,680,290, Cl. 514-182.000.

Cassoli, Paolo, to Cassoli s.r.l. Macchine Automatiche Confezionatrici. Automatic bundling machine. 4,679,379, Cl. 53-438.000.

Cassoli s.r.l. Macchine Automatiche Confezionatrici: *See*—
Cassoli, Paolo, 4,679,379, Cl. 53-438.000.

Castegnier, Adrien, to Elcorsy Inc. Method of preventing undesirable gas generation between electrodes of an electrocoagulation printing system. 4,680,097, Cl. 204-180.100.

Castellani, Giovanni. Shaft-mounted planetary speed-reducing gear unit featuring a balanced, self-aligning and self-distancing ring gear. 4,679,464, Cl. 74-788.000.

Caterpillar Inc.: *See*—
Budzich, Tadeusz, 4,679,492, Cl. 91-420.000.
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., 4,679,857, Cl. 299-37.000.

Caterpillar Industrial Inc.: *See*—
Melocik, Grant C., 4,680,512, Cl. 318-139.000.

Cattano, John D.: *See*—
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,679,316, Cl. 29-731.000.

Caumont, Jean-Francois, to Tempo Sanys. Method of making a hydrophilic cotton fleece. 4,679,278, Cl. 19-66.0CC.

Cavallaro, Paul V., to United States of America, Army. Quick-connect-/disconnect connector. 4,679,959, Cl. 403-143.000.

Cavestany, Adrian V., to Raypak, Inc. Gas-fired outdoor spa and hot tub heater. 4,679,545, Cl. 126-350.00R.

Cazaux, Yves: *See*—
Berger, Jean L.; Brissot, Louis; and Cazaux, Yves, 4,680,476, Cl. 250-578.000.

Cedraeus, Hugo: *See*—
Soderhold, Jan; and Cedraeus, Hugo, 4,679,688, Cl. 206-204.000.

Celanese Corporation: *See*—
Rosenfeld, Jerold C.; and Pawlak, Joseph A., 4,680,371, Cl. 528-179.000.
Rosenfeld, Jerold C., 4,680,372, Cl. 528-179.000.

Centraal Diergeneeskundig Instituut: *See*—
Berns, Antonius J. M.; and Gielkens, Arnold L. J., 4,680,176, Cl. 424-89.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Monfort, Guy; Crahay, Jean; and Bragard, Adolphe, 4,679,288, Cl. 29-121.800.

Centre Electronique Horloger SA: *See*—
Rudolf, Felix, 4,680,544, Cl. 324-259.000.

Centre National de la Recherche Scintifique: *See*—
Letournel, Michel; Helleboid, Jean-Marie; and Teissier, Claude, 4,680,496, Cl. 310-308.000.

Century Wrecker Corporation: *See*—
Holmes, Gerald E.; and Pace, Jerry E., 4,679,978, Cl. 414-563.000.

Cerqua, Kathleen A.: *See*—
Jacobs, Stephen D.; and Cerqua, Kathleen A., 4,679,911, Cl. 350-347.00E.

Cervantes, Ramiro E., Sr. Automatically adjustable ladder support. 4,679,652, Cl. 182-200.000.

CGR Ultrasonic: *See*—
Lannuzel, Olivier, 4,680,739, Cl. 367-90.000.

Cha, Charles Y.; and Varsanik, Richard G., to Calgon Corporation. Carboxylic/sulfonic polymer and carboxylic/polyalkylene oxide polymer admixtures for use in iron oxide deposit control. 4,680,135, Cl. 252-180.000.

Chamberlain, Thomas E.: *See*—
Fouchey, John W.; and Chamberlain, Thomas E., 4,679,327, Cl. 33-203.130.

Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., to Courtaulds PLC. Polymer compositions. 4,680,335, Cl. 524-501.000.

Chan, Ning-Huat, to AVX Corporation. Fail safe ceramic capacitor. 4,680,670, Cl. 361-275.000.

Chan, Tsiu C.; and Han, Yu-Pin, to Thomson Components-Mostek Corp. Method of making a trench capacitor and dram memory cell. 4,679,300, Cl. 29-571.000.

Chand, Sujeet; and Sadre, Ahmad, to General Electric Co. Recursive methods for world-to-joint transformation for a robot manipulator. 4,680,519, Cl. 318-568.000.

Chang, Phillip, to International Business Machines Corporation. Magnetic brush developer. 4,679,527, Cl. 118-658.000.

Chang, Robert: *See*—
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, 4,680,149, Cl. 264-2.100.

Chang, Yuehsiung, to Amoco Corporation. Aqueous recovery of cobalt or cobalt and manganese from solution also containing oxygenated aromatic compounds. 4,680,098, Cl. 204-182.400.

Chappuis, Clyde L.: *See*—
Heldenbrand, Stanley W.; and Chappuis, Clyde L., 4,679,867, Cl. 312-287.000.

Chapsal, Paul; and Petitimbert, Jean-Francois, to Trailigaz "Cie Generale de l'Ozone" . Electric 3-phase supply device for an ozonizer. 4,680,686, Cl. 363-10.000.

Chase, Fred G., Sr.: *See*—
Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., 4,679,764, Cl. 251-14.000.

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Caspari, Richard B., 4,679,552, Cl. 128-132.00D.

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Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

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Pandey, Sue D.; and Buss, Waldeen C., 4,680,280, Cl. 502-66.000.
Plavac, Frank, 4,680,129, Cl. 252-51.50A.

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Isoyama, Toyoshiro; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,680,137, Cl. 252-299.620.

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Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

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Kim, Ho K.; and Choi, Seung E., 4,679,407, Cl. 62-294.000.

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Fowler, Kerry W.; and Chorvat, Robert J., 4,680,295, Cl. 514-258.000.

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Willis, Donald H.; Fling, Russell T.; and Christopher, Todd J., 4,680,632, Cl. 358-166.000.

Chronar Corp.: *See*—
Delahoy, Alan E.; and Tonon, Thomas, 4,680,616, Cl. 357-59.000.

Chrysler Motors Corporation: *See*—
Fouchey, John W.; and Chamberlain, Thomas E., 4,679,327, Cl. 33-203.130.
Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., 4,679,844, Cl. 296-136.000.

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DiMatteo, Paul; and Chubb, Charles F., 4,679,259, Cl. 5-81.00R.
Chugai Denki Kogyo K.K.: *See—*
Shibata, Akira, 4,680,162, Cl. 419-21.000.
CI.KA.RA S.p.A.: *See—*
Ciordinik, Jacques; and Penzo, Alessandro, 4,680,573, Cl. 340-541.000.
Ciba-Geigy Corporation: *See—*
Back, Gerhard, 4,680,385, Cl. 534-695.000.
Kristinsson, Haukur; and Topfl, Werner, 4,680,395, Cl. 544-321.000.
Leeson, Lewis J., 4,680,172, Cl. 424-449.000.
Pfeifer, Josef, 4,680,195, Cl. 427-44.000.
Rao, Vittal R., 4,680,301, Cl. 514-321.000.
Seitz, Karl; Riat, Henri; and Hoegerle, Karl, 4,680,384, Cl. 534-622.000.
Cibie Projecteurs: *See—*
Dilouya, Gilbert, 4,680,679, Cl. 362-61.000.
Ciordinik, Jacques; and Penzo, Alessandro, to CI.KA.RA S.p.A. Intrusion warning wire fence. 4,680,573, Cl. 340-541.000.
Citizen Watch Co., Ltd.: *See—*
Fujita, Hiroo, 4,679,941, Cl. 356-384.000.
Clairol Incorporated: *See—*
Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.
Clarion Co., Ltd.: *See—*
Miyazaki, Takao; and Yamamoto, Hideo, 4,680,650, Cl. 360-33.100.
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12.000.
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Clasen, Rolf; and Scholz, Heinz, to U.S. Philips Corporation. Method for the manufacture of glass bodies. 4,680,047, Cl. 65-17.000.
Clement, Thomas J.: *See—*
Opie, Eric A.; and Clement, Thomas J., 4,679,557, Cl. 128-305.000.
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Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve ; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.
Clinton, Peter; Myers, Ronald V.; and Sinclair, David. Fluid-gauging systems. 4,679,433, Cl. 73-304.00C.
Coates, Fredrica V.; Jannoni, Richard; and Orsini, Jean. Garment having improved, self closing, filamentary fasteners. 4,680,030, Cl. 604-391.000.
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Raab, Andrew F.; and Cobb, Albert R., III, 4,679,588, Cl. 137-560.000.
Coca-Cola Company, The: *See—*
Gupta, Ashis S.; and Camp, Jerald T., 4,680,060, Cl. 134-26.000.
Sedam, Jason K., 4,679,707, Cl. 222-129.100.
Cochran, Michael J., to Texas Instruments Incorporated. Asynchronous high speed processor having high speed memories with domino circuits contained therein. 4,680,701, Cl. 364-200.000.
Cochran, Richard C.: *See—*
King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., 4,679,951, Cl. 400-110.000.
Coe, Larry D. Cylindrical back plane structure for receiving printed circuit boards. 4,679,872, Cl. 439-61.000.
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Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,679,314, Cl. 29-598.000.
Cogema, Framatome et Uranium Pechiney: *See—*
Vere, Bernard; and Mathevon, Paul, 4,680,443, Cl. 219-121.0ED.
Cogoli, Augusto: *See—*
Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, 4,680,266, Cl. 435-284.000.
Coker, James N., to Du Pont de Nemours, E. I., and Company. Blends of ionomers and linear polyesters. 4,680,344, Cl. 525-176.000.
Coletti, Don A. Apparatus and method for propelling an object. 4,679,799, Cl. 273-318.000.
Collier, John R., to Ohio University. Sheath core composite extrusion and a method of making it by melt transformation coextrusion. 4,680,156, Cl. 264-171.000.
Collins, Floyd K.; and Hassler, George E., to North American Philips Consumer Electronics Corp. Strengthening means for a CRT in-line electrode component. 4,680,501, Cl. 313-456.000.
Collins, Galen: *See—*
Deering, Michael F.; and Collins, Galen, 4,680,626, Cl. 358-80.000.
Collins, George J.: *See—*
Bell, William E.; and Collins, George J., 4,680,770, Cl. 372-99.000.
Combustion Engineering, Inc.: *See—*
Holmes, Myron L.; and Smolensky, Leo A., 4,679,511, Cl. 110-216.000.
Overbay, Mark A., 4,679,315, Cl. 29-726.000.
Tanca, Michael C., 4,680,035, Cl. 48-77.000.
Commonwealth Technology Incorporated: *See—*
Carpenter, Richard H., 4,679,504, Cl. 102-348.000.
Compagnie Generale de Material Orthopedique: *See—*
Pecheux, Jean-Claude R., 4,679,548, Cl. 128-26.000.
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Compton, Peter M., to Tektronix, Inc. Staggered ground-plane microstrip transmission line. 4,680,557, Cl. 333-1.000.
Conax Florida Corporation: *See—*
Miller, Francis M., 4,680,537, Cl. 324-500.000.
Conner, Donald E., to Mallinckrodt, Inc. Benzene sulfonate quaternary ammonium salts of organic sunscreen carboxylic acids. 4,680,144, Cl. 260-501.150.
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Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, 4,680,266, Cl. 435-284.000.
Cook, David J.; and Lim, Nam W., to Unisearch Limited. Building material. 4,680,059, Cl. 106-120.000.
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., to Phillips Petroleum Company. Hydrodemetallization of oils with catalysts comprising nickel phosphate and titanium phosphate. 4,680,105, Cl. 208-251.00H.
Cooper, executrix; by Rose H.: *See—*
Axelrod, Robert J.; and Cooper, Glenn D., deceased, 4,680,342, Cl. 525-132.000.
Cooper, Alan: *See—*
Brocklebank, Norman; and Cooper, Alan, 4,679,336, Cl. 37-103.000.
Cooper, Glenn D., deceased: *See—*
Axelrod, Robert J.; and Cooper, Glenn D., deceased, 4,680,342, Cl. 525-132.000.
Cooper Industries, Inc.: *See—*
Bray, Thomas J., 4,680,706, Cl. 364-492.000.
Edwards, Carl H., 4,680,567, Cl. 337-164.000.
Coquard, Jean; and Goletto, Jean, to Rhone-Poulenc Specialties Chimiques. Homogeneous copolyamide comprised of hexamethylenediamine/adipic acid/short chain diacid/dimer acid and catalytic preparation thereof. 4,680,379, Cl. 528-336.000.
Corcoran, Dan E. Repositionable directional markers. 4,680,210, Cl. 428-42.000.
Cordeiro, Craig A.; and Graham, John P., to Data General Corporation. Microprocessor based control and switching device. 4,680,788, Cl. 379-93.000.
Cornell Research Foundation, Inc.: *See—*
Dalman, G. Conrad; and Kondoh, Hiroshi, 4,680,538, Cl. 324-58.00R.
King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., 4,679,951, Cl. 400-110.000.
Corrao, Mark; and Shaffer, David T., to AMP Incorporated. Electrical component having fuse element, and method of using same. 4,680,568, Cl. 337-186.000.
Cortot, Jean P.: *See—*
Blanchard, Pierre; and Cortot, Jean P., 4,679,301, Cl. 29-571.000.
Courtaulds PLC: *See—*
Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., 4,680,335, Cl. 524-501.000.
Coutant, Patrick: *See—*
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,679,988, Cl. 417-218.000.
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Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., 4,680,571, Cl. 340-52.00R.
Cover, Kenneth R.: *See—*
Packard, Richard F.; and Cover, Kenneth R., 4,680,790, Cl. 379-432.000.
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., to S. C. Johnson & Son, Inc. Fabric finish with alpha olefin resins and process. 4,680,202, Cl. 427-389.900.
Coyle, William E., Sr. Power tongs controller with persisting torque. 4,679,469, Cl. 81-470.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Substituted-3-(2,3-dihydro-1H-inden-5-yl)-4-hydroxy-1H-pyrrole-2,5-diones. 4,680,414, Cl. 548-544.000.
Crahay, Jean: *See—*
Monfort, Guy; Crahay, Jean; and Bragard, Adolphe, 4,679,288, Cl. 29-121.800.
Crane Canada Inc.: *See—*
Liberman, Richard, 4,679,770, Cl. 251-328.000.
Crapser, James R.; and Malek, Edward J., to S. C. Johnson & Son, Inc. Valve actuator. 4,679,713, Cl. 222-402.130.
Crawford, Micheal B., to Dresser Industries, Inc. Method for case hardening rock bits and rock bits formed thereby. 4,679,640, Cl. 175-374.000.
Crawford, Neville: *See—*
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.
Cremer, Heinz P.: *See—*
Putsch, Peter-Ulrich; and Cremer, Heinz P., 4,679,854, Cl. 297-486.000.
Creydt, Martin; Bickle, Wolfgang; and Pfestorf, Harald, to Kolbenschmidt AG. Synchronizing ring and process of manufacturing the same. 4,679,681, Cl. 192-107.00M.
Crook, James C. Digital speed control of motors. 4,680,515, Cl. 318-318.000.
Crop Control Products Limited: *See—*
Pay, Christopher C., 4,679,735, Cl. 239-708.000.
Croucher, Melvin D.: *See—*
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., 4,680,332, Cl. 524-377.000.
Crouse, Stanley G.: *See—*
Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boiti, Franco, 4,679,653, Cl. 182-2.000.

Crump, Druce K.; Simon, Jaime; and Wilson, David A., to Dow Chemical Company, The. Bis(aminoalkyl)piperazine derivatives and their use as metal ion control agents. 4,680,396, Cl. 544-337.000.

Cruz-Uribe, Antonio S.; Hubbard, David W.; and Raman, Gopalan, to Pitney Bowes Inc. Impulse ink jet print head and method of making same. 4,680,595, Cl. 346-140.00R.

Cuisia, Dionisio G.; and Hwa, Chih M., to W. R. Grace & Co. Method of inhibiting the deposition of scale in an aqueous system. 4,680,125, Cl. 210-697.000.

Culkin, Joseph B., to Dorr-Oliver Incorporated. Method and apparatus for measuring the unsteady sedimentation potential of colloidal particles. 4,679,439, Cl. 73-61.400.

Cumbo, Peter E.; and Fricker, Robert F., to Eastman Kodak Company. Analytical element and method for colorimetric determination of total cholesterol. 4,680,259, Cl. 435-11.000.

Cuming, Kenneth J. Solenoid booster. 4,679,766, Cl. 251-129.040.

Cunningham, Michael J. Space saver cart. 4,679,805, Cl. 280-33.99R.

Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., to United States of America, Air Firce. In situ small particle diagnostics. 4,679,939, Cl. 356-336.000.

Curtze, Edward W., to Libbey-Owens-Ford Co. Article supporting fixture. 4,679,525, Cl. 118-500.000.

Custom Technical Enterprises: *See—*
Houseman, Walter R., 4,679,487, Cl. 89-140.000.

Cycles Peugeot: *See—*
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,679,850, Cl. 297-410.000.

Cymbaluk, Ted H.: *See—*
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,680,105, Cl. 208-251.00H.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Maki, Hirohisa; and Matsuo, Katsuaki, 4,680,203, Cl. 427-393.600.

Daido Metal Company Ltd.: *See—*
Muto, Takashi, 4,680,161, Cl. 419-3.000.

Daiichi Pure Chemicals Co., Ltd.: *See—*
Sakai, Yasuo; and Hirata, Miyoshi, 4,680,274, Cl. 436-512.000.

Daikin Kogyo Co., Ltd.: *See—*
Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, 4,680,331, Cl. 524-269.000.

Daimler-Benz Aktiengesellschaft: *See—*
Lux, Horst; and Schatzler, Walter, 4,679,846, Cl. 296-214.000.

Dainichiseika Color & Chemicals MFG. Co., Ltd.: *See—*
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Shimano, Noriyuki; Tokura, Isao; and Yamada, Mitsuhiko, 4,680,642, Cl. 358-280.000.

Dallmaier, Gunter, to Paul Troester Machinenfabrik. Apparatus for winding cable on cable drums. 4,679,743, Cl. 242-54.00R.

Dalman, G. Conrad; and Kondoh, Hiroshi, to Cornell Research Foundation, Inc. Millimeter wave vector network analyzer. 4,680,538, Cl. 324-58.00R.

Dammann, Hans; and Kurz, Heinrich, to U.S. Philips Corporation. Compound optical phase grating and optical switch. 4,679,901, Cl. 350-162.200.

Damon Biotech, Inc.: *See—*
Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.

Damron, Tony R. Grapple snubber. 4,679,839, Cl. 294-119.400.

Dana Corporation: *See—*
Zawodni, Frank W., 4,679,667, Cl. 188-341.000.

Danieli & C. Officine Meccanische SpA: *See—*
Poloni, Alfredo, 4,679,801, Cl. 277-53.000.

Daniels, Wilbert E.; and Fraser, Dana J., to Fairchild Semiconductor Corporation. Low impedance package for integrated circuit die. 4,680,613, Cl. 357-72.000.

Danilyak, Sergei N.: *See—*
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Dardenne, Mireille: *See—*
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Dare Products, Inc.: *See—*
Wilson, Robert M., Jr., 4,680,428, Cl. 174-158.00F.

Darlington, W. Bruce; and DuBois, Donald W., to PPG Industries, Inc. Electrolyte permeable diaphragm including a polymeric metal oxide. 4,680,101, Cl. 204-295.000.

Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., to PPG Industries, Inc. Color plus clear coating system utilizing inorganic microparticles. 4,680,204, Cl. 427-407.100.

Data General Corporation: *See—*
Cordeiro, Craig A.; and Graham, John P., 4,680,788, Cl. 379-93.000.

Daun, Klaus-Dieter. Method and apparatus for cleaning plate heat exchangers used for recovering heat from exhaust gases. 4,679,620, Cl. 165-95.000.

Davco Manufacturing Corporation: *See—*
Davis, Leland L., 4,680,110, Cl. 210-114.000.

Davey, Brian, to Lion Brush Works Limited. Containers for cosmetics. 4,679,692, Cl. 206-581.000.

David Systems, Inc.: *See—*
Wakerly, John F., 4,680,779, Cl. 375-107.000.

Davidow, Clifford A., to Lynch Communication Systems, Inc. Universal high-speed span line switch. 4,680,750, Cl. 370-16.000.

Davis, Irwin J., to National Starch and Chemical Corporation. Removable hot melt pressure sensitive adhesive. 4,680,333, Cl. 524-394.000.

Davis, James R.; and McConnell, Michael P. Head support cushion. 4,679,262, Cl. 5-434.000.

Davis, Leland L., to Davco Manufacturing Corporation. Filter block mounted fuel processor apparatus. 4,680,110, Cl. 210-114.000.

Davis, William N., II; and Nash, Ruth E., to NCR Corporation. User-friendly technique and apparatus for entering alphanumeric data through a numeric keyboard. 4,680,728, Cl. 364-900.000.

Davy McKee A.G.: *See—*
Heinze, Helmut; and Wilhelm, Fritz, 4,680,376, Cl. 528-279.000.

Dawawala, Suryakant K.; and LaCoste, Bernard L., to Westinghouse Electric Corp. Steam turbine control valve for cyclic duty. 4,679,769, Cl. 251-282.000.

Day, Paul N.: *See—*
Vijan, Meera; McGill, John C.; and Day, Paul N., 4,680,085, Cl. 156-643.000.

Day, Roger A.: *See—*
Munro, Robert; and Day, Roger A., 4,679,493, Cl. 92-212.000.

Dayco Products, Inc.: *See—*
Bryan, James S.; and Meadows, Roger D., 4,679,293, Cl. 29-450.000.
Wetzel, Robert E., 4,679,999, Cl. 474-153.000.

Dayen, Leonid: *See—*
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, 4,679,675, Cl. 192-67.00R.

De La Rue Company PLC, The: *See—*
Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., 4,680,801, Cl. 382-3.000.

De la Rue Giori S.A.: *See—*
Moore, John, 4,680,067, Cl. 156-165.000.

Deacon, Edwin R.: *See—*
Swihart, William R.; and Deacon, Edwin R., 4,679,984, Cl. 415-163.000.

Deane, Graham: *See—*
Weightman, Barry O.; and Deane, Graham, 4,680,026, Cl. 604-33.000.

Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., to Vsesojuzny Nauchno-Issledovatelsky Institut Genetiki. Method for producing human leukocyte interferon alpha-2. 4,680,260, Cl. 435-68.000.

DeBeers Industrial Diamond Division (Propietary): *See—*
Tank, Klaus, 4,679,858, Cl. 299-91.000.

De Clue, Larry W.: *See—*
Price, John E.; and De Clue, Larry W., 4,680,486, Cl. 307-475.000.

Dedicated Technologies, Inc.: *See—*
Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., 4,680,571, Cl. 340-52.00R.

Deere & Company: *See—*
Kramer, Kenneth D.; and Olson, Rohn L., 4,679,765, Cl. 251-38.000.
Lundahl, E. Cordell; West, Neil L.; and Witzel, Homer D., 4,679,386, Cl. 56-126.000.

Deering, Michael F.; and Collins, Galen, to Benson, Inc. Color image processing system for converting analog video-to-digital data. 4,680,626, Cl. 358-80.000.

Degussa Aktiengesellschaft: *See—*
Andrade, Juan; and Prescher, Gunter, 4,680,420, Cl. 549-476.000.
Ginter, Herbert; Klingel, Reinhard; and Manner, Reinhard, 4,680,043, Cl. 65-2.000.

de Haan, Freidrich J., administrator: *See—*
Haisma, Jan; van der Werf, Pieter; Robertson, John M., deceased; and de Haan, Freidrich J., administrator, 4,679,892, Cl. 350-96.120.

Deighton, Michael O.: *See—*
Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., 4,679,430, Cl. 73-290.00V.

de Jong, Anno: *See—*
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.

Delahoy, Alan E.; and Tonon, Thomas, to Chronar Corp. Removal of defects from semiconductors. 4,680,616, Cl. 357-59.000.

Delmege, Dale; and Rask, Richard O., to Standard Precision, Inc. Drawer slide with infinite adjustment locking mechanism. 4,679,950, Cl. 384-18.000.

Delnero, Thomas V. Broken cork remover. 4,679,467, Cl. 81-3.070.

DeLong, Bradley W., to Phillips Petroleum Company. Method for cooling normally gaseous material. 4,680,041, Cl. 62-11.000.

DeLorenzo, Anthony N.: *See—*
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.

by De Luca, Raymond F., to Georgia-Pacific Corporation. Device for preventing napkins from bunching at the dispensing opening in a paper napkin dispenser. 4,679,703, Cl. 221-52.000.

Demers, Harlan, to Koppers Company, Inc. Gaff. 4,679,658, Cl. 182-221.000.

Deseret Medical, Inc.: *See—*
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.

Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, to General Motors Corporation. Motor vehicle windshield cowl plate. 4,679,845, Cl. 296-192.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Touch responsive musical tone generator. 4,679,478, Cl. 84-1.100.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Forster, Jurgen, 4,680,166, Cl. 422-159.000.
Lahr, Helfrid; and Pontani, Bernd, 4,680,159, Cl. 376-272.000.

Devall, Jeffrey E.; and Reinke, Ronald E., to Borg-Warner Automotive, Inc. Vapor vent control valve. 4,679,580, Cl. 137-39.000.

de Vries, Franciscus J. M.: *See—*
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1.00R.

de Vries, Joseph D. M.: *See—*
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1.00R.

Dewitte, Elisabeth: *See—*
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,680,296, Cl. 514-259.000.

Diafoil Company, Limited: *See—*
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, 4,680,217, Cl. 428-141.000.

DiCenzo, Daniel A., to NCR Corporation. Interface circuit for connecting peripheral equipment to a computer terminal. 4,680,732, Cl. 364-900.000.

Dickerson, Arthur F. Inverter for use with solar arrays. 4,680,690, Cl. 363-43.000.

Diehl GmbH & Co.: *See—*
Kriz, Helmut; and Stadler, Hansjorg, 4,679,915, Cl. 350-611.000.
Remmel, Jochen; and Buchinger, Robert, 4,679,776, Cl. 267-140.100.
Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, 4,679,503, Cl. 102-208.000.

Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal benzodisultam derivative, compositions and method of use therefor. 4,680,052, Cl. 71-91.000.

Dietch, Leonard, to Zenith Electronics Corporation. Method for shadow mask protection during manufacture. 4,680,196, Cl. 427-68.000.

Dietz, Peter W.: *See—*
Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., 4,680,532, Cl. 323-240.000.
Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.

Dilella, Antonio, to NCR Corporation. Method and apparatus for isolating image data for character recognition. 4,680,803, Cl. 382-9.000.

Dill, Walter R.; Walker, Michael L.; and Ford, William G. F., to Halliburton Company. Composition and method of stimulating subterranean formations. 4,679,631, Cl. 166-307.000.

Dilouya, Gilbert, to Cibie Projecteurs. Motor vehicle main beam headlamp incorporating an elliptical reflector and a parabolic reflector. 4,680,679, Cl. 362-61.000.

Di Manno, Richard A.: *See—*
Biletch, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., 4,680,337, Cl. 525-53.000.

DiMarco, Bernard; and Stanford, Charles W., to Siemens-Allis, Inc. Multi-pole molded case circuit breaker with a common contact operating crossbar member. 4,680,564, Cl. 335-16.000.

Di Marco, Joel E.: *See—*
Goldsmith, Wesley R.; and Di Marco, Joel E., 4,679,329, Cl. 33-538.000.

DiMatteo, Paul; and Chubb, Charles F., to Nova Technologies, Inc. Reclinable wheelchair apparatus. 4,679,259, Cl. 5-81.00R.

Dimier, Jean P.: *See—*
Pascal, Roger; and Dimier, Jean P., 4,679,815, Cl. 280-618.000.

Dirck, Ronald L. Removable cab top for vehicles. 4,679,847, Cl. 296-218.000.

Dismon, Peter: *See—*
Weidenhaupt, Wolfgang; and Dismon, Peter, 4,679,387, Cl. 57-212.000.

Dispoto, Gary J.; Mather, Larry R.; and Meyer, John D., to Hewlett-Packard Company. Method for rendering gray scale images with variable dot sizes. 4,680,645, Cl. 358-298.000.

Dix, James S.: *See—*
Leland, John E.; Dix, James S.; and Wright, Roy F., 4,680,326, Cl. 524-106.000.

Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., to International Business Machines Corporation. Mechanism for positioning an output member. 4,680,524, Cl. 318-696.000.

Dockrey, Jasper W.: *See—*
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, 4,679,820, Cl. 280-781.000.
Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, 4,680,493, Cl. 310-62.000.

Dodey, Pierre: *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.

Dohrer, Gregory L.; and Knight, George W., to Dow Chemical Company, The. Insect resistant polyethylene composition suitable for wire and cable applications. 4,680,328, Cl. 524-137.000.

Dola, Frank P.: *See—*
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.

Doland, George D. Autosync circuit for error correcting block decoders. 4,680,765, Cl. 371-42.000.

Dolganov, Grigory M.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Dolman, Rodney A.: *See—*
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.

Donn Incorporated: *See—*
Shirey, Richard, 4,679,375, Cl. 52-777.000.

Donner, Hans-Gunter: *See—*
Wernicke, Ubbo; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jurgen, 4,680,123, Cl. 210-683.000.

Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., to Rendoll Paper Company. Carton and blank for packaging ice cream or the like. 4,679,694, Cl. 206-611.000.

Dorda, Gerhard: *See—*
Schmitt-Landsiedel, Doris; and Dorda, Gerhard, 4,680,481, Cl. 307-279.000.

Dorr-Oliver Incorporated: *See—*
Culkin, Joseph B., 4,679,439, Cl. 73-61.400.

Dosaj, Vishu D.; and Rauchholz, Alvin W., to Dow Corning Corporation. Plasma smelting process for silicon. 4,680,096, Cl. 204-164.000.

Doskocil, Walter: *See—*
Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, 4,680,365, Cl. 528-15.000.

Doss, James D., to United States of America, Energy. Implantable apparatus for localized heating of tissue. 4,679,561, Cl. 128-422.000.

Dothan, Felix: *See—*
Lund, Walter; Berman, Lou; and Dothan, Felix, 4,679,570, Cl. 128-715.000.

Dotzler, Josef; and Meier, Johann, to Grammer Sitzsysteme GmbH. Spring arrangement. 4,679,760, Cl. 248-602.000.

Doud, Wilbur O., to Ball Corporation. Glassware molding machine with unitary axis molding and method of molding glassware. 4,680,050, Cl. 65-79.000.

Dougherty, Robert C., to Durodyne, Inc. High tensile strength removable hose covering. 4,679,600, Cl. 138-128.000.

Doughty, John: *See—*
Seddon, Alan E.; and Doughty, John, 4,679,672, Cl. 191-41.000.

Douglas, Barry D.; and McCurdy, Frederick A., to General Motors Corporation. Quick disconnect device. 4,679,956, Cl. 403-14.000.

Douglas, William A., to United Technologies Automotive, Inc. Hot applied, expandable sealer. 4,680,316, Cl. 521-89.000.

Dow Chemical Company, The: *See—*
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,680,396, Cl. 544-337.000.
Dohrer, Gregory L.; and Knight, George W., 4,680,328, Cl. 524-137.000.
Evans, Thomas E.; and Bowen, Christine M., 4,680,211, Cl. 428-65.000.
Flores, David P.; Meiller, John G.; and Massie, James D., 4,680,357, Cl. 526-265.000.
Fujioka, George S., 4,680,406, Cl. 546-345.000.
Hefner, Robert E., Jr., 4,680,378, Cl. 528-322.000.
Kelch, Robert H., 4,680,234, Cl. 428-461.000.
Lipp, Charles W., 4,679,733, Cl. 239-432.000.
Miller, Theodore E., Jr.; and Iskandarani, Ziad, 4,679,428, Cl. 73-61.10C.
Solc, Jitka, 4,680,200, Cl. 427-213.340.
Treybig, Duane S., 4,680,347, Cl. 525-519.000.
Wang, Pen C., 4,680,410, Cl. 548-231.000.
Williams, Janet C., 4,680,370, Cl. 528-167.000.

Dow Corning Corporation: *See—*
Dosaj, Vishu D.; and Rauchholz, Alvin W., 4,680,096, Cl. 204-164.000.

Draeger, Erich, to Veglia. Probe for measuring the level of a liquid. 4,679,432, Cl. 73-295.000.

Drayer, William, to General Motors Corporation. Integral evaporator and accumulator for air conditioning system. 4,679,410, Cl. 62-503.000.

Drazil, Jaromir Vaclav: *See—*
Carternock, Frederick A.; and Knackstedt, Jack S., 4,679,337, Cl. 37-118.00R.

Dreibelbis, Richard L.; and Hunt, Oliver L., to Du Pont de Nemours, E. I., and Company. Spinneret having groups of orifices with various interorifice spacing. 4,679,998, Cl. 425-72.00S.

Dresser Europe S.A.: *See—*
Kok, Frans J. J. A., 4,679,830, Cl. 285-323.000.

Dresser Industries, Inc.: *See—*
Crawford, Micheal B., 4,679,640, Cl. 175-374.000.
Kleeb, Thomas R., 4,680,279, Cl. 501-124.000.
Wolff, Harold E., 4,679,584, Cl. 137-269.000.

Drexler, Jerome, to Drexler Technology Corporation. Data system employing wallet-size optical card. 4,680,456, Cl. 235-454.000.

Drexler, Jerome, to Drexler Technology Corporation. Laser recording and storage medium. 4,680,458, Cl. 235-487.000.

Drexler, Jerome, to Drexler Technology Corporation. Updatable micrographic pocket data card. 4,680,459, Cl. 235-487.000.

Drexler, Jerome, to Drexler Technology Corporation. System and method for making recordable wallet-size optical card. 4,680,460, Cl. 235-488.000.

Drexler Technology Corporation: *See—*
Drexler, Jerome, 4,680,456, Cl. 235-454.000.
Drexler, Jerome, 4,680,458, Cl. 235-487.000.
Drexler, Jerome, 4,680,459, Cl. 235-487.000.
Drexler, Jerome, 4,680,460, Cl. 235-488.000.

Driskel, Stephen P., to BICC Public Limited Company. Optical fibre element for use in an optical cable. 4,679,897, Cl. 350-96.230.

Druffel, Erich, to Durkoppwerke GmbH. Thread-tensioning device for a bobbin housing. 4,679,513, Cl. 112-229.000.

DuBois, Donald W.: *See—*
Darlington, W. Bruce; and DuBois, Donald W., 4,680,101, Cl. 204-295.000.

Ducharme, Gerard E.: *See—*
Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., 4,679,764, Cl. 251-14.000.

Dueringer, Rudi, to S. Franzen Sohne GmbH & Co. Closure mechanism for suitcases or the like. 4,679,833, Cl. 292-113.000.

Duforestel, Guy G.; Lechaczynski, Michel A.; Poiraud, Clement Y.; and Viallon, Paul P., to International Business Machines Corporation. Device for serializing/deserializing bit configurations of variable length. 4,680,733, Cl. 364-900.000.

Dumas, Phillip E.: *See—*
Stockel, Richard F.; and Dumas, Phillip E., 4,680,286, Cl. 514-23.000.

Dumoulin, Charles L., to General Electric Company. Methods of, and pulse sequences for, the supression of undesired resonances by generation of quantum coherence in NMR imaging and spectroscopy. 4,680,546, Cl. 324-307.000.

Dunkley, Rowland A. G.: *See—*
Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., 4,680,801, Cl. 382-3.000.

Dunlop, Raymond B.; and Taylor, William E. G. Gravity pipe transport system. 4,679,704, Cl. 222-56.000.

Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., to Mallinckrodt, Inc. Anti-oxidant isocyanurate ester of thioamidophenol and polyolefins stabilized therewith. 4,680,325, Cl. 524-101.000.

Du Pont de Nemours, E. I., and Company: *See—*
Coker, James N., 4,680,344, Cl. 525-176.000.
Dreibelbis, Richard L.; and Hunt, Oliver L., 4,679,998, Cl. 425-72.00S.
Forrest, Albert W., Jr., 4,679,283, Cl. 26-73.000.
Hasircoglu, Alexander W., 4,679,868, Cl. 439-495.000.
Janowicz, Andrew H.; and Melby, Lester R., 4,680,352, Cl. 526-147.000.
Schober, Manfred, 4,680,251, Cl. 430-306.000.
Wallace, Lawrence R., 4,680,334, Cl. 521-406.000.
Weed, Gregory C., 4,680,249, Cl. 430-281.000.

Dupre, Milburn E. Energy conserving refrigeration apparatus and method. 4,679,986, Cl. 417-53.000.

Durholz, Friedrich: *See—*
Skipka, Guido; and Durholz, Friedrich, 4,680,146, Cl. 260-505.00R.

Durkoppwerke GmbH: *See—*
Druffel, Erich, 4,679,513, Cl. 112-229.000.

Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, to Hoechst Aktiengesellschaft. Process for producing white and colored resists on polyamide fiber materials using reactive dye in free vinyl sulphone form. 4,680,033, Cl. 8-449.000.

Durodyne, Inc.: *See—*
Dougherty, Robert C., 4,679,600, Cl. 138-128.000.

Duruz, Jean-Jacques, to ELTECH Systems Corporation. Method for producing aluminum, aluminum production cell and anode for aluminum electrolysis. 4,680,094, Cl. 204-67.000.

Dvorak, Robert E.; and Fattedad, Frank D. Board game apparatus representing transportation. 4,679,798, Cl. 273-254.000.

Dyer, Christopher K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for restoring the lost capacity of nickel batteries and batteries formed thereby. 4,680,241, Cl. 429-49.000.

Dyer, Hugh D.: *See—*
Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., 4,679,881, Cl. 439-392.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Kuhnel, Werner; and Spielau, Paul, 4,680,317, Cl. 521-89.000.

Dynisco, Inc.: *See—*
Wareham, William, 4,679,438, Cl. 73-726.000.

Dziedzic, Jerome J., to Flur Wire & Metal Inc. Workpiece holder for coating processes. 4,679,526, Cl. 118-503.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.

E.I. Du Pont de Nemours and Company: *See—*
Hesson, David P., 4,680,299, Cl. 514-311.000.
Levitt, George; and Zimmerman, William T., 4,680,053, Cl. 71-93.000.

E. R. Squibb & Sons, Inc.: *See—*
Opie, Eric A.; and Clement, Thomas J., 4,679,557, Cl. 128-305.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,680,388, Cl. 540-203.000.
Treuner, Uwe D., 4,680,409, Cl. 548-194.000.

Eastern Company, The: *See—*
Weinerman, Lee S.; and Vargus, Joel T., 4,679,835, Cl. 292-197.000.

Eastman Kodak Company: *See—*
Blessinger, Kurt V., 4,680,651, Cl. 360-38.100.
Cumbo, Peter E.; and Fricker, Robert F., 4,680,259, Cl. 435-11.000.
Maskasky, Joe E., 4,680,254, Cl. 430-567.000.
Maskasky, Joe E., 4,680,255, Cl. 430-567.000.
Maskasky, Joe E.; and Jones, Ralph W., 4,680,256, Cl. 430-567.000.
Washburn, William N.; and Hollister, Kenneth R., 4,680,356, Cl. 526-256.000.

Ebara Corporation: *See—*
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.

Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink jet recorder with improved system for transporting ink to or from recording heads. 4,680,696, Cl. 346-75.000.

Ecklund, Lawrence M., to Motorola, Inc. Dual purpose variable Q filter. 4,680,795, Cl. 381-15.000.

Ecolab Inc.: *See—*
Heile, Bernard J.; and Klos, Terry J., 4,680,134, Cl. 252-160.000.

Economy Forms Corporation: *See—*
Brotherton, Thomas W., 4,679,763, Cl. 249-189.000.

Ed. Zublin Aktiengesellschaft: *See—*
Glaser, Eberhard; and Beitinger, Eberhard, 4,679,965, Cl. 405-258.000.

Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMR. 4,680,548, Cl. 324-318.000.

Edelstein, William A.: *See—*
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Edge, David J.; Naik, Appaya R.; and Scott, Melvin, to Lever Brothers Company. Detergent compositions. 4,680,143, Cl. 252-553.000.

Edmondson, James G., to Betz Laboratories, Inc. Method of scavenging hydrogen sulfide. 4,680,127, Cl. 210-749.000.

Edwards, Carl H., to Cooper Industries, Inc. Time delay electric fuse. 4,680,567, Cl. 337-164.000.

Edwards, Jonathan; Waller, David L.; and May, Michael D., to Inmos Limited. High density ROM in separate isolation well on single with chip. 4,680,698, Cl. 364-200.000.

Edwards, Richard B.: *See—*
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,680,132, Cl. 252-108.000.

Efron, Uzi; and Soffer, Bernard H., to Hughes Aircraft Company. Dual liquid-crystal cell-based visible-to-infrared dynamic image converter. 4,679,910, Cl. 350-335.000.

Egawa, Yoshinori, to Yamaichi Electric Mfg. Co., Ltd. IC package connector. 4,679,871, Cl. 439-70.000.

Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Benzopyrans. 4,680,404, Cl. 546-269.000.

Egri, Janos: *See—*
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.

EGYT Gyogyszervegyeszeti Gyar: *See—*
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.

Eimer, Klaus; and Gebhardt, Wolfgang, to Taprogge Gesellschaft mbH. Sieve arrangement for recovering cleaning particles from a cooling-water stream downstream of a heat exchanger. 4,680,113, Cl. 210-181.000.

Eisenblatter, Gerd. Lamellar end grinding wheel. 4,679,360, Cl. 51-337.000.

Ekblom, Karl-Erik, to Oy Wartsila AB. Arrangement in a roll wrapping apparatus for the application of headers. 4,679,376, Cl. 53-137.000.

Eklund, Dan, to Oy Wartsila Ab. Arrangement for web coating. 4,679,524, Cl. 118-122.000.

Elcorsy Inc.: *See—*
Castegnier, Adrien, 4,680,097, Cl. 204-180.100.

Electricite de France Service National: *See—*
Mancel, Gerard, 4,679,529, Cl. 122-441.000.

Electrohome Limited: *See—*
Waldeck, Gerald, 4,680,555, Cl. 331-108.00D.

Eli Lilly and Company: *See—*
Birmingham, Virginia A.; and Seno, Eugene T., 4,680,265, Cl. 435-172.300.

Eller, Dennis E. Motorboat propeller guard for improved performance. 4,680,017, Cl. 440-66.000.

Elliott Turbomachinery Co., Inc.: *See—*
Strickler, Roger D., 4,679,399, Cl. 60-646.000.

Ellis, Leslie G., to Rodger, Ian Gordon. Crusher having opposed and balanced driver jaws. 4,679,742, Cl. 241-266.000.

Elmasry, Mohamed A., to Minnesota Mining and Manufacturing Company. Polymeric cyanine dye. 4,680,375, Cl. 528-253.000.

Elpan, Aps: *See*—
Keldmann, Erick C. V., 4,679,617, Cl. 165-56.000.

ELTECH Systems Corporation: *See*—
Duruz, Jean-Jacques, 4,680,094, Cl. 204-67.000.

Emanuelson, Bjorn, to Autoliv Development AB. Seat belt anchorage. 4,679,853, Cl. 297-468.000.

Emhart Industries, Inc.: *See*—
Blumenfeld, John F.; and Bubon, Frank, 4,680,051, Cl. 65-346.000.

EMI Limited: *See*—
Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., 4,680,591, Cl. 343-853.000.

Engineering Measurements Co.: *See*—
Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., 4,679,947, Cl. 374-42.000.

England, Thomas R.: *See*—
Schultz, Roy D.; England, Thomas R.; and Altizor, C. Clark, 4,679,313, Cl. 29-596.000.

Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., to General Electric Compeny. Duplex radio transceiver having improved data/tone and audio modulation architecture. 4,680,749, Cl. 370-11.000.

Enichem Elastomeri S.p.A.: *See*—
Roggero, Arnaldo, 4,680,407, Cl. 546-348.000.

Enomoto, Hiromu: *See*—
Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, 4,680,600, Cl. 357-15.000.

Ensci Incorporated: *See*—
Horiuchi, Tetsuro, 4,680,277, Cl. 501-27.000.

Enviro-Spray Systems, Inc.: *See*—
Magid, David J.; Svitila, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.

Environmental Management Associates, Inc.: *See*—
Ward, Irl E., 4,680,133, Cl. 252-153.000.

EPID. Inc.: *See*—
Beilin Solomon I.; and Truong, Long K., 4,680,103, Cl. 204-299.00R.

Eppink, Jay M., to Hughes Tool Company. Downhole progressive cavity type drilling motor with flexible connecting rod. 4,679,638, Cl. 175-107.000.

Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, to New Brunswick Scientific Company, Inc. Fermentor control system. 4,680,267, Cl. 435-289.000.

Erie Scientific Company: *See*—
Rosenberg, H. James, 4,679,914, Cl. 350-534.000.

Eriksson, Bo G.: *See*—
Petitjean, Robert; and Eriksson, Bo G., 4,679,729, Cl. 237-8.00R.

Erma Optical Works, Ltd.: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., to Metallgesellschaft Aktiengesellschaft; and New Zealand Steel Ltd. Apparatus for removing oversize from the hot material discharged from a rotary kiln used to produce sponge iron by a direct reduction of iron oxide containing materials. 4,680,009, Cl. 432-117.000.

Ersfeld, Heinrich: *See*—
Schulte, Klaus; and Ersfeld, Heinrich, 4,680,003, Cl. 425-206.000.

Esselte Meto International GmbH: *See*—
Volk, Heinrich, 4,679,500, Cl. 101-111.000.

Esselte Pendaflex Corporation: *See*—
Hetzer, Norbert, 4,679,339, Cl. 40-10.00R.

Etablissements les fils d'Auguste Chomarat et Cie: *See*—
Fourezon, Andre , 4,680,213, Cl. 428-105.000.

Este, Grantley O., to Northern Telecom Limited. Surface acoustic wave devices. 4,680,497, Cl. 310-313.00C.

Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, to Interferon Sciences, Inc. Interferon administration vehicles. 4,680,175, Cl. 424-85.000.

Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., to De La Rue Company PLC, The. Sign verification. 4,680,801, Cl. 382-3.000.

Ettingshausen, Othmar V.: *See*—
Portz, Heinz; and Ettingshausen, Othmar V., 4,680,064, Cl. 148-617.000.

Evans, Sean A.: *See*—
Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, 4,680,175, Cl. 424-85.000.

Evans, Thomas E.; and Bowen, Christine M., to Dow Chemical Company, The. Recording disks. 4,680,211, Cl. 428-65.000.

Evertz, Egon; and Seybold, Rolf, to Evertz, Egon. Apparatus for grinding a semifinished steel product. 4,679,355, Cl. 51-99.000.

Ewing, James H., to MKS Instruments, Inc. Flowmeter-controlled valving. 4,679,585, Cl. 137-486.000.

Exarque, Jean; and Camand, Michel, to Societe Anonyme Dite. Device for coding-decoding a binary digital signal bit stream for an "OQPSK" digital modulator-demodulator with four phase states. 4,680,775, Cl. 375-39.000.

Exxon Chemical Patents Inc.: *See*—
Portnoy, Robert C., 4,680,128, Cl. 252-8.511.

Exxon Research and Engineering Company: *See*—
Bolland, Daniel B., 4,679,425, Cl. 73-49.200.

Eylon, Daniel: *See*—
Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,680,063, Cl. 148-11.50F.

F. M. Locotos Co., Inc.: *See*—
Hipkins, Edward C., Sr.; and Locotos, Frank M., 4,679,967, Cl. 405-288.000.

Factor, Arnold; and Patel, Gautam A., to General Electric Company. Abrasion and UV resistant coating compositions. 4,680,232, Cl. 428-412.000.

Fairchild Semiconductor Corporation: *See*—
Daniels, Wilbert E.; and Fraser, Dana J., 4,680,613, Cl. 357-72.000.

Falcon Jet Corporation: *See*—
Ryan, James M.; and Gilmore, Arthur H., 4,679,749, Cl. 244-122.00R.

Fallier, Charles N., Jr.; and Lester, James N., to GTE Laboratories, Inc.; and GTE Products Corporation. Method and apparatus for starting high intensity discharge lamps. 4,680,509, Cl. 315-290.000.

Fanslau, Christine: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,680,719, Cl. 364-474.000.
Kiya, Nobuyuki; and Yoshino, Motoaki, 4,680,697, Cl. 364-171.000.
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,680,518, Cl. 318-561.000.
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, 4,680,520, Cl. 318-594.000.

Fanuc Ltd: *See*—
Kobari, Katsuo; and Ishida, Hiroshi, 4,680,525, Cl. 318-798.000.

Farge, Daniel: *See*—
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,680,303, Cl. 514-336.000.

Farha, Floyd E.: *See*—
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,680,351, Cl. 526-125.000.

Farkas, Frank J., to General Motors Corporation. Draincock and drain hole for a liquid vessel. 4,679,618, Cl. 165-71.000.

Farquharson, Graeme J.: *See*—
Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., 4,680,400, Cl. 546-141.000.

Farrell, John J., to Wedco Inc. Method and apparatus for producing multilayered plastic containing sheets. 4,680,072, Cl. 156-243.000.

Fasching, George E., to United States of America, Energy. Pulse-excited, auto-zeroing multiple channel data transmission system. 4,680,585, Cl. 340-870.130.

Fattedad, Frank D.: *See*—
Dvorak, Robert E.; and Fattedad, Frank D., 4,679,798, Cl. 273-254.000.

Fechalos, William A., to Rockwell International Corporation. Multifunction bus. 4,680,754, Cl. 370-85.000.

Fecht, David C.: *See*—
Ranford, Alan B.; and Fecht, David C., 4,680,029, Cl. 604-280.000.

Federal Cartridge Corporation: *See*—
Reed, Hugh B., 4,679,505, Cl. 102-449.000.

Fegan, Stuart G.: *See*—
Lowe, Barrie M.; and Fegan, Stuart G., 4,680,170, Cl. 423-329.000.

Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, to Robert Bosch GmbH. Damping device. 4,679,537, Cl. 123-447.000.

Feisel, Magaret A.: *See*—
Baker, Daniel G.; and Feisel, Magaret A., 4,680,621, Cl. 358-19.000.

Fekete, Gyorgy: *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Feller, Otto; Brocksieper, Manfred; and Luckger, Rolf, to Goetze AG. Method and apparatus for machining the circumference of out-of-round workpieces, particularly piston rings. 4,679,472, Cl. 82-19.000.

Fender, Norman N.: *See*—
Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Feng, Lung S. Press fastener. 4,679,282, Cl. 24-614.000.

Fennemann, Wolfgang, to Metallgesellschaft Aktiengesellschaft. Process of producing a V_2O_5-and-alkali-metal-sulfate-containing catalyst for oxidizing SO_2 to SO_3. 4,680,281, Cl. 502-218.000.

Fennig, Jeffrey A.: *See*—
Fruehan, Mark T.; Fennig, Jeffrey A.; and Kapadia, Jayant K., 4,679,508, Cl. 105-341.000.

Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., to Suetrak U.S.A., Inc. Roof-mounted air conditioner system having modular evaporator and condensor units. 4,679,616, Cl. 165-43.000.

Fernsler, Ronald E.: *See*—
Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., 4,680,511, Cl. 315-411.000.

Ferranti, plc: *See*—
Morley, Robert A.; and Buick, James M., 4,680,012, Cl. 434-22.000.
St. Clair, John S.; and Brignall, Nicolas L., 4,680,522, Cl. 318-664.000.

Ferrari, Loris: *See*—
Gaiti, Giorgio; and Ferrari, Loris, 4,679,270, Cl. 15-29.000.

Ferriere Nord SpA: *See*—
Compagnucci, Rossano; and Masera, Ercole, 4,679,746, Cl. 242-77.200.

Ferriola, John J.: *See—*
Lawrence, Craig J.; and Ferriola, John J., 4,679,774, Cl. 266-246.000.
Ferro Corporation: *See—*
Williams, Charles F.; and Sahni, Atam P., 4,680,139, Cl. 252-511.000.
Fest, Christa: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Fester, Earl L. Infrared space heater. 4,680,448, Cl. 219-365.000.
Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., to Kelley Company Inc. Dock seal. 4,679,364, Cl. 52-173.0DS.
F'Geppert, Erwin, to United States of America, Army. Concave-convex gear pair having staggered teeth. 4,679,459, Cl. 74-460.000.
Fidler, Jerry D.: *See—*
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., 4,679,857, Cl. 299-37.000.
Field, Anthony J., to U.S. Philips Corporation. Apparatus for processing digital video signals to produce a television image by line and field sequential scanning. 4,680,630, Cl. 358-160.000.
Field, Bruce F.; and Kasper, Joseph G., to Tennant Company. Automatic tool force compensator for a surface maintenance machine. 4,679,271, Cl. 15-49.00C.
Fields, Eddie L. Self-tripping rippers. 4,679,635, Cl. 172-260.500.
Figge, Dieter: *See—*
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,679,612, Cl. 164-431.000.
Figgie International Inc.: *See—*
Mitchell, Hal D.; and Walker, Donald R., 4,679,253, Cl. 2-2.000.
Fineblum, Solomon S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Connector contact terminal. 4,679,890, Cl. 439-884.000.
Finfinger, Gerald L.; King, Roger L.; and Marshall, Thomas E., to United States of America, Interior. Gas content determination of evaporite formations using acoustic emissions during dissolution. 4,679,435, Cl. 73-594.000.
Finn, Chris J.; and Youngner, Daniel W., to Honeywell Inc. Process for controlling mobile ion contamination in semiconductor devices. 4,679,308, Cl. 29-576.00B.
Finnegan, John P.: *See—*
Chiampas, George E.; Finnegan, John P.; and Villegas, Henry, 4,680,495, Cl. 310-220.000.
Firestone, Raymond A.; and Barker, Peter L., to Merck & Co., Inc. Substituted azetidinones as anti-inflammatory and antidegenerative agents. 4,680,391, Cl. 540-355.000.
Fischer, Bruno: *See—*
Nussbaumer, Manfred; and Fischer, Bruno, 4,679,312, Cl. 29-596.000.
Fischer, Karl; Schreder, Felix; and Kicherer, Robert, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate with a thermostat. 4,680,452, Cl. 219-449.000.
Fish, Donald D., to W. F. Meyers Company, Inc. Belt-configured saw for cutting slots into stone. 4,679,541, Cl. 125-21.000.
Fish, William R.: *See—*
Blau, David A.; and Fish, William R., 4,679,568, Cl. 128-696.000.
Fisher, Leonard A., to Carlin Company, The. Blower augmentor for power oil and power gas burners. 4,680,006, Cl. 431-265.000.
Fisher Scientific Company: *See—*
Kelln, Norman G., 4,680,164, Cl. 422-72.000.
Fisherman, Carl; and Beare, Eric, to Photo Audio Consumer Electronics Marketing Corporation. Integral book cover and reading light. 4,680,681, Cl. 362-98.000.
Fitt, Peter W., to I C Gas International Limited. Absorption refrigeration cycle. 4,679,409, Cl. 62-476.000.
Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., to RCA Corporation. Video apparatus for generating a conductively isolated control signal. 4,680,511, Cl. 315-411.000.
Flach, Werner, to Siemens Aktiengesellschaft. Data network interface module with circuitry for disconnecting a module that has lost supply voltage. 4,680,431, Cl. 178-69.00R.
Flamholz, Alexander L., to International Business Machines Corporation. Defect detection in films on ceramic substrates. 4,679,938, Cl. 356-237.000.
Fleenor, Richard P.: *See—*
Sheehan, Neil J.; Oppenlander, Jon E.; and Fleenor, Richard P., 4,679,446, Cl. 73-864.130.
Fletcher, Gary S., Jr.: *See—*
Fuller, Milton E.; and Fletcher, Gary S., Jr., 4,679,426, Cl. 73-53.000.
Flindt, Werner; and Noll, Hans, to Klockner Wilhelmsburger GmbH. Method and apparatus for welding two pipes along their line of penetration. 4,679,722, Cl. 228-168.000.
Fling, Russell T.: *See—*
Willis, Donald H.; Fling, Russell T.; and Christopher, Todd J., 4,680,632, Cl. 358-166.000.
Florence, Max, to Sulcabrush Inc. Toothbrush. 4,679,272, Cl. 15-106.000.
Flores, David P.; Meiller, John G.; and Massie, James D., to Dow Chemical Company, The. Interpolymers of ethylene and alkenyl pyridines and preparation thereof. 4,680,357, Cl. 526-265.000.
Flow Industries, Inc.: *See—*
Olsen, John H., 4,679,826, Cl. 285-149.000.
Fluckiger, Ernst: *See—*
Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, 4,680,198, Cl. 427-164.000.
Flur Wire & Metal Inc.: *See—*
Dziedzic, Jerome J., 4,679,526, Cl. 118-503.000.
FMC Corporation: *See—*
Lambrecht, Emiel, 4,679,474, Cl. 83-171.000.
Focke & Co., (GmbH & Co.): *See—*
Focke, Heinz; and Balmer, Oskar, 4,680,024, Cl. 493-197.000.
Focke, Heinz; and Balmer, Oskar, to Focke & Co., (GmbH & Co.). Apparatus for producing bags from a tubular sheet of thermally weldable film material. 4,680,024, Cl. 493-197.000.
Fogelberg, Mark J., to Borg-Warner Corporation. Transmission anti-clash and anti-rattle brake. 4,679,663, Cl. 188-82.100.
Fogg, Stephen W., to Bendix Limited. Two-circuit fluid pressure control valve. 4,679,594, Cl. 137-627.500.
Fong, Dodd W., to Nalco Chemical Company. Carboxylate containing modified acrylamide polymers. 4,680,339, Cl. 525-54.110.
Ford, David M., to Ford Motor Company. Assembly for mounting a vibrating body. 4,679,759, Cl. 248-562.000.
Ford Motor Company: *See—*
Ford, David M., 4,679,759, Cl. 248-562.000.
Pietryk, Erwin; and Rauthmann, Axel, 4,679,983, Cl. 415-152.00A.
Thorn, John E.; and Burns, William W., 4,679,698, Cl. 220-86.00R.
Ford, William G. F.: *See—*
Dill, Walter R.; Walker, Michael L.; and Ford, William G. F., 4,679,631, Cl. 166-307.000.
Forester, David R.; and Reid, Dwight K., to Betz Laboratories, Inc. Composition and method for coke retardant during pyrolytic hydrocarbon processing. 4,680,421, Cl. 585-648.000.
Forgacs, Lilla: *See—*
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
Forman, Harold. Label resealing container. 4,679,693, Cl. 206-610.000.
Forrest, Albert W., Jr., to Du Pont de Nemours, E. I., and Company. Device for biaxially stretching film. 4,679,283, Cl. 26-73.000.
Forster, Jurgen, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Arrangement for centering and manipulating conduits in a large-area cell for reprocessing irradiated nuclear fuel. 4,680,166, Cl. 422-159.000.
Foster, Donald D.; and Moore, David G., to Realex Corporation. Orifice cover slide actuator lock for viscous product dispenser. 4,679,712, Cl. 222-384.000.
Foster, Joseph S., to Pro-Staff Fuels Ltd. Dual fuel engines. 4,679,538, Cl. 123-525.000.
Foster, Raymond K. Bearing system for reciprocating floor conveyor. 4,679,686, Cl. 198-750.000.
Fouchey, John W.; and Chamberlain, Thomas E., to Chrysler Motors Corporation. Front wheel drive vehicle, automatic toe set alignment system, therefor. 4,679,327, Cl. 33-203.130.
Fourezon, Andre , to Establissements les fils d'Auguste Chomarat et Cie. Textile reinforcement used for making laminated complexes, and novel type of laminate comprising such a reinforcement. 4,680,213, Cl. 428-105.000.
Fourie, Phillippus J. Device for cleaning teeth. 4,679,577, Cl. 132-92.00R.
Fourrey, Francois: *See—*
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,679,850, Cl. 297-410.000.
Fow, Louis F., Jr.: *See—*
Hofstetter, Donald R.; and Fow, Louis F., Jr., 4,680,068, Cl. 156-196.000.
Fowler, David P.: *See—*
Budd, David L.; and Fowler, David P., 4,680,191, Cl. 426-439.000.
Fowler, Kerry W.; and Chorvat, Robert J., to G. D. Searle & Co. Octahydropyrido[1,2-c]pyrimidinones and hexahydropyrido[1,2-c]pyrimidinediones. 4,680,295, Cl. 514-258.000.
Frank, Dieter. Forked thill head attachment. 4,679,518, Cl. 114-98.000.
Frank, Gerald L.: *See—*
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84.000.
Frankard, James M.; and Broch, Orville V. Separation and recovery of reusable heavy metal hydroxides from metal finishing wastewaters. 4,680,126, Cl. 210-710.000.
Frankel, Eric; and Plucinski, Andrzej J., to Becton, Dickinson and Company. Blood sample needle assembly with vein indicator. 4,679,571, Cl. 128-764.000.
Franklin, Grover C., Jr. Apparatus for introducing a gas into a liquid. 4,680,119, Cl. 210-512.100.
Franz, Patrick J.: *See—*
Straayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., 4,680,577, Cl. 340-711.000.
Fraser, Dana J.: *See—*
Daniels, Wilbert E.; and Fraser, Dana J., 4,680,613, Cl. 357-72.000.
Freeman, Richard B., to Gainesville 1920 Corporation, The. Yogurt separator device. 4,680,117, Cl. 210-469.000.
Freidinger, Roger: *See—*
Veber, Daniel F.; and Freidinger, Roger, 4,680,283, Cl. 514-17.000.
Fremont Special Machine Co., Inc.: *See—*
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,679,316, Cl. 29-731.000.
Simonton, Robert D.; and Breese, Douglas E., 4,680,242, Cl. 429-136.000.

French, James C.: *See—*
Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., 4,680,416, Cl. 549-292.000.
Freschi, Claudio: *See—*
Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, 4,680,340, Cl. 525-72.000.
Frettem, Peter O. Flexible stretcher device. 4,679,260, Cl. 5-82.00R.
Fricker, Robert F.: *See—*
Cumbo, Peter E.; and Fricker, Robert F., 4,680,259, Cl. 435-11.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,679,612, Cl. 164-431.000.
Hansen, Kolbjorn, 4,679,741, Cl. 241-206.000.
Kiefer, Silvan, 4,679,444, Cl. 73-827.000.
Friedman, Jack C. Finger manipulated oral hygiene device. 4,679,274, Cl. 15-167.00R.
Friesen, Terry V. Sailboard assembly having a limited diplacement mast. 4,679,516, Cl. 114-39.000.
Frisch, Kurt C.; and Ashida, Kaneyoshi, to Polymetrics Corporation. Reinforced foam composites. 4,680,214, Cl. 428-107.000.
Frito-Lay, Inc.: *See—*
Budd, David L.; and Fowler, David P., 4,680,191, Cl. 426-439.000.
Froes, Francis H.: *See—*
Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,680,063, Cl. 148-11.50F.
Frosch, Jurgen: *See—*
Wernicke, Ubbo; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jurgen, 4,680,123, Cl. 210-683.000.
Froschle, Reinhard: *See—*
Richter, Gunter; and Froschle, Reinhard, 4,679,357, Cl. 51-281.00P.
Fruehan, Mark T.; Fennig, Jeffrey A.; and Kapadia, Jayant K., to Westinghouse Electric Corp. Transit vehicle door control apparatus. 4,679,508, Cl. 105-341.000.
Fry, Steven A.; and Stafford, Rodney L. Seat for a truck bed. 4,679,840, Cl. 296-64.000.
Fuji Heavy Industries Ltd.: *See—*
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Miyawaki, Motohisa, 4,680,711, Cl. 364-424.100.
Sakakiyama, Ryuzo, 4,679,674, Cl. 192-0.052.
Sakakiyama, Ryuzo; and Takano, Toshio, 4,680,712, Cl. 364-424.100.
Fuji Photo Film Co., Ltd.: *See—*
Chikamasa, Hiroshi; and Sakaguchi, Masaaki, 4,679,744, Cl. 242-67.30R.
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.
Naito, Hiroichi, 4,680,657, Cl. 360-111.000.
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.
Oishi, Kengo, 4,680,661, Cl. 360-133.000.
Sato, Hideaki; and Yagihara, Morio, 4,680,257, Cl. 430-614.000.
Shibahara, Yoshihiko; and Ikoma, Hideto, 4,680,253, Cl. 430-504.000.
Ueda, Masaki, 4,680,660, Cl. 360-132.000.
Fuji Seiki Machine Works, Ltd.: *See—*
Suzuki, Akira, 4,679,359, Cl. 51-321.000.
Fuji Xerox Co. Ltd.: *See—*
Sato, Shigeru; and Ozawa, Takashi, 4,680,477, Cl. 250-578.000.
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, to Idemitsu Petrochemical Co., Ltd. Method for the preparation of a crystalline thermoplastic resin sheet. 4,680,157, Cl. 264-180.000.
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, to Mitsubishi Petrochemical Co., Ltd. Foaming resin composition. 4,680,318, Cl. 521-95.000.
Fujikura Ltd.: *See—*
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.
Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, 4,680,449, Cl. 219-385.000.
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, to Matsushita Electric Industrial Co., Ltd. Solid state color imaging apparatus producing chrominance and luminance signals from unsaturated ores of n color signals. 4,680,623, Cl. 358-44.000.
Fujimoto, Noboru: *See—*
Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.
Fujino, Bonpei: *See—*
Hoshino, Shiro; and Fujino, Bonpei, 4,680,022, Cl. 446-487.000.
Fujioka, George S., to Dow Chemical Company, The. Process for fluorinating halogenated organo-compounds. 4,680,406, Cl. 546-345.000.
Fujioka, Kazunori, to Alps Electric Co., Ltd. Motor drive control device. 4,680,517, Cl. 318-332.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
Fujita, Hiroo, to Citizen Watch Co., Ltd. Micro-dimensional measurement apparatus. 4,679,941, Cl. 356-384.000.
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, to Toshiba Kikai Kabushiki Kaisha. Injection pressure monitoring method and apparatus. 4,680,151, Cl. 264-40.300.
Fujitsu Limited: *See—*
Baba, Fumio; and Takemae, Yoshihiro, 4,680,734, Cl. 365-190.000.
Ikeuchi, Satoshi; and Taniguchi, Ikuo, 4,680,776, Cl. 375-40.000.
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.
Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, 4,680,758, Cl. 370-110.200.
Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, 4,680,600, Cl. 357-15.000.
Tanaka, Shoji, 4,680,079, Cl. 156-353.000.
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.
Fujiwara, Yoshinari: *See—*
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, to Sanyo Electric Co., Ltd. Photovoltaic cell. 4,680,607, Cl. 357-30.000.
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, to Honda Giken Kogyo Kabushikikaisha. Light distribution of headlight beam. 4,679,935, Cl. 356-121.000.
Fukumoto, Masami: *See—*
Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, 4,679,990, Cl. 417-312.000.
Fukunaga, Masao: *See—*
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.
Fukunaga, Yasushi: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.
Fukushima, Hiroshi: *See—*
Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.
Fukushima, Nobuo; and Iwata, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Display unit. 4,680,629, Cl. 358-147.000.
Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, to Matsushita Electric Industrial Co., Ltd. Disk cartridge having a shutter mechanism. 4,680,662, Cl. 360-133.000.
Fuller, Milton E.; and Fletcher, Gary S., Jr. Wave shape chemical analysis apparatus and method. 4,679,426, Cl. 73-53.000.
Fulton, Temple L.; and Perkins, William O., to Texas Instruments Incorporated. System and method for controlling network bus communications for input-output interlocking information among distributed programmable controllers. 4,680,753, Cl. 370-85.000.
Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, to Sharp Kabushiki Kaisha; and Ushio Denki Kabushiki Kaisha. Small size discharge lamp having sufficient arc length and high luminous efficiency. 4,680,505, Cl. 313-558.000.
Funada, Fumiaki: *See—*
Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, 4,679,909, Cl. 350-333.000.
Funaki, Takashi; and Nakatsuka, Katsuto, to Yakumo Industrial Corporation, a part interest. Vibration damping equipment. 4,679,775, Cl. 267-64.270.
Fung, Anthony K.: *See—*
Luly, Jay R.; Plattner, Jacob J.; and Fung, Anthony K., 4,680,284, Cl. 514-18.000.
Furst, Wilhelm: *See—*
Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, 4,679,503, Cl. 102-208.000.
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, to Sanyo Electric Co., Ltd. Method for starting fuel cell power systems. 4,680,240, Cl. 429-13.000.
Furukawa, Shunske: *See—*
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.
Furuya, Tsuneo: *See—*
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Yamaura, Tatsuo; and Takahashi, Hisamitsu, 4,680,231, Cl. 428-407.000.
G. D. Searle & Co.: *See—*
Fowler, Kerry W.; and Chorvat, Robert J., 4,680,295, Cl. 514-258.000.
G. Duesterloh GmbH: *See—*
Klie, Juergen; and Weiss, Hans-Wilhelm, 4,679,533, Cl. 123-179.00F.
G.F. S.r.l.: *See—*
Gaiti, Giorgio; and Ferrari, Loris, 4,679,270, Cl. 15-29.000.
Gainesville 1920 Corporation, The: *See—*
Freeman, Richard B., 4,680,117, Cl. 210-469.000.
Gaiser, Robert F.: *See—*
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6.00C.
Gaiti, Giorgio; and Ferrari, Loris, to G.F. S.r.l. Wash brush operated by the wash water. 4,679,270, Cl. 15-29.000.
Galambos, Janos: *See—*
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Galbraith, Douglas C., to Leland Stanford Junior University, Board of Trustees of the. Wide band inductive transdermal power and data link. 4,679,560, Cl. 128-419.00R.

Gallagher, Patrick E.; and Greenberg, Ronald A., to General Electric Company. Process for the production of a random copolymer containing repeating polyimide units and repeating polyetherimide units. 4,680,373, Cl. 528-185.000.

Galloway, James J.; and Madrigal, Anthony. Mechanical device for transmitting signals through a swivel connection. 4,679,645, Cl. 180-65.800.

Galves, Jean P.: *See*—
Boit, Jean C.; and Galves, Jean P., 4,680,461, Cl. 250-213.0VT.

Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., to American District Telegraph Company. Electrical interconnection apparatus and technique. 4,679,881, Cl. 439-392.000.

Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., to United States of America, Air Force. Fiber optic pyrometry with large dynamic range. 4,679,934, Cl. 356-43.000.

Garcia, Augusto M.: *See*—
Orero, Francisco O.; and Garcia, Augusto M., 4,679,523, Cl. 116-173.000.

Garfield Weston Trust for Research into Heart Surgery, Trustees of the: *See*—
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.

Garrett Corporation, The: *See*—
Swihart, William R.; and Deacon, Edwin R., 4,679,984, Cl. 415-163.000.

Gasaway, Jack S.: *See*—
Parsons, James S.; and Gasaway, Jack S., 4,680,027, Cl. 604-68.000.

Gat, Anita S.; and Westerberg, Eugene R., to A. G. Associates. Apparatus using high intensity CW lamps for improved heat treating of semiconductor wafers. 4,680,451, Cl. 219-411.000.

Gates Rubber Company, The: *See*—
Newberry, Mark A.; and Kemper, Dennis C., 4,679,599, Cl. 138-104.000.

Gavva, Viktor M.: *See*—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Geagley, Bradley: *See*—
Sherin, Alan; Geagley, Bradley; and Benest, Glenn, 4,679,797, Cl. 273-251.000.

Geary, Frederick J., to Robertshaw Controls Company. Primary gas furnace control. 4,680,005, Cl. 431-46.000.

Gebhardt, Wolfgang: *See*—
Eimer, Klaus; and Gebhardt, Wolfgang, 4,680,113, Cl. 210-181.000.

Geering, Hans P.: *See*—
van Zanten, Anton; Heess, Gerhard; and Geering, Hans P., 4,679,866, Cl. 303-104.000.

Geiser, Markus; and Vandevoir, Claude, to Sameca SA. Guide-bar device for multi-spindle lathe. 4,679,470, Cl. 82-2.700.

Geisthardt, Alan C., to Jack Walters & Sons, Corp. Interconnecting of wooden members. 4,679,367, Cl. 52-233.000.

Geitner, Otto: *See*—
Schieber, Hans; and Geitner, Otto, 4,679,412, Cl. 66-71.000.

Genco, Louis V.; and Task, Harry L., to United States of America, Air Force. Device for measuring intraocular light scatter. 4,679,917, Cl. 351-221.000.

GenCorp Inc.: *See*—
Sharma, Satish C., 4,680,228, Cl. 428-378.000.

Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, to Nippon Soda Co., Ltd. Process for the production of 3-phenyl-4-cyanopyrroles. 4,680,413, Cl. 548-526.000.

Genentech, Inc.: *See*—
Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, 4,680,262, Cl. 435-68.000.

General Electric Company: *See*—
Axelrod, Robert J.; and Cooper, Glenn D., deceased, 4,680,342, Cl. 525-132.000.
Beers, Melvin D., 4,680,363, Cl. 528-14.000.
Betts, Joseph E.; and Holub, Fred F., 4,680,229, Cl. 428-389.000.
Brown, Sterling B.; and McFay, Dennis J., 4,680,329, Cl. 524-143.000.
Chand, Sujeet; and Sadre, Ahmad, 4,680,519, Cl. 318-568.000.
Dumoulin, Charles L., 4,680,546, Cl. 324-307.000.
Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.
Factor, Arnold; and Patel, Gautam A., 4,680,232, Cl. 428-412.000.
Gallagher, Patrick E.; and Greenberg, Ronald A., 4,680,373, Cl. 528-185.000.
Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.
Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., 4,680,532, Cl. 323-240.000.
Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.
Kelm, James S.; Maclin, Harvey M.; Vickers, Edward C.; and Wakeman, Thomas G., 4,679,400, Cl. 60-722.000.
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,679,314, Cl. 29-598.000.
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.
Lucas, Gary M., 4,680,364, Cl. 528-15.000.
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jith M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.
Rios, Pedro A., 4,680,666, Cl. 361-141.000.
Rucki, William M., 4,680,508, Cl. 315-166.000.
Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., 4,680,709, Cl. 364-414.000.
Wei, Ching-Yeu; and Pimbley, Joseph M., 4,680,603, Cl. 357-23.300.

General Kinematics Corporation: *See*—
Spence, James F., 4,679,708, Cl. 222-161.000.

General Motors Corporation: *See*—
Ballantyne, David B., 4,679,285, Cl. 29-11.000.
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.
Brandenburg, Darrell L., 4,679,906, Cl. 350-281.000.
Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.
Douglas, Barry D.; and McCurdy, Frederick A., 4,679,956, Cl. 403-14.000.
Drayer, William, 4,679,410, Cl. 62-503.000.
Farkas, Frank J., 4,679,618, Cl. 165-71.000.
Goding: David J.; and Ramos, Remigio R., 4,679,506, Cl. 105-136.000.
Gold, Thomas P.; and Vogel, John E., 4,679,777, Cl. 267-140.100.
Hodonsky, Joseph W., 4,679,779, Cl. 267-140.100.
Hoerig, Klaus; and Gora, Hans-Joachim, 4,679,649, Cl. 180-291.000.
King, Donald J.; and Lederman, Frederick E., 4,679,676, Cl. 192-45.000.
Nagy, Laszlo, 4,679,455, Cl. 74-359.000.
Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., 4,679,885, Cl. 439-620.000.
Polak, James C., 4,679,454, Cl. 74-330.000.
Pupillo, Dominic S.; and Scheff, Luben, 4,679,836, Cl. 292-216.000.
Rassaian, Mostafa, 4,679,507, Cl. 105-136.000.
Sanders, Robert K., 4,679,593, Cl. 137-625.650.
Sharma, Ram A., 4,680,055, Cl. 75-84.500.
Van Cise, Kenneth L., Jr., 4,679,417, Cl. 70-247.000.

General Signal Corporation: *See*—
Blome, Eugene R., 4,679,689, Cl. 206-334.000.

Gentex Corporation: *See*—
Bauer, Frederick T., 4,680,576, Cl. 340-630.000.

Genus, Inc.: *See*—
Mahawili, Imad, 4,680,447, Cl. 219-343.000.

Georgia-Pacific Corporation: *See*—
De Luca, Raymond F., 4,679,703, Cl. 221-52.000.

Geosource, Inc.: *See*—
Wales, C. Ernest; and Peterson, Mitchell F., 4,680,741, Cl. 367-189.000.

Gerdes, Richard C.; and Vokac, Peter R., to Third Domain, Inc. Circuit and method for producing accurate dc restored video waveform, horizontal sync pulses, and vertical sync pulses. 4,680,633, Cl. 358-171.000.

Gerhard Collardin GmbH: *See*—
Portz, Heinz; and Ettingshausen, Othmar V., 4,680,064, Cl. 148-617.000.

Gerharz, Reinhold, to United States of America, Army. Process and apparatus for measuring optical density changes and transit times in transparent materials. 4,679,936, Cl. 356-128.000.

GerroKaiser Dosenwerk GmbH & Co KG: *See*—
Jendick, Manfred, 4,679,659, Cl. 184-15.200.

Gewerkschaft Eisenhutte Westfalia: *See*—
Merten, Gerhard; Rafael, Werner; and Schlusener, Horst, 4,679,429, Cl. 73-168.000.

Ghosh, Subir; and Junior, Aluizio P., to Telecomunicacoes Brasileiras S/A - Telebras. Corrugated transition device for use between a continuous and a corrugated circular waveguide with signal in two different frequency bands. 4,680,558, Cl. 333-21.00R.

Gibb, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., to Minnesota Mining and Manufacturing Company. Particulate ceramic useful as a proppant. 4,680,230, Cl. 428-403.000.

Gibbons, David L., to Marathon Oil Company. Oil recovery process using a viscosity adjusted gelation system. 4,679,625, Cl. 166-270.000.

Gibson, William H., to Otis Elevator Company. Modular gearless elevator drive. 4,679,661, Cl. 187-20.000.

Gielkens, Arnold L. J.: *See*—
Berns, Antonius J. M.; and Gielkens, Arnold L. J., 4,680,176, Cl. 424-89.000.

Giles, Grady L.; Wilson, Jesse R.; and Hulett, Terry V., to Motorola, Inc. Accelerated test apparatus and support logic for a content addressable memory. 4,680,760, Cl. 371-21.000.

Gill, Devinder S.: *See*—
Schwartz, Paul; Gill, Devinder S.; and McGrath, Kenneth J., 4,680,308, Cl. 514-492.000.

Gillespie, Arthur B.: *See*—
Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., 4,679,430, Cl. 73-290.00V.

Gillette Company, The: *See*—
Kirk, Bryan R., 4,679,324, Cl. 30-346.580.

Gilmore, Arthur H.: *See*—
Ryan, James M.; and Gilmore, Arthur H., 4,679,749, Cl. 244-122.00R.

Gimpel, Franco; and Brichta, Corrado, to Gimpel, Franco. Accelerated crosslinking of polyolefins grafted with silanes. 4,680,319, Cl. 523-210.000.

Gingline, Lin, to Te-Chin Handicraft Enterprise Co., Ltd. Arm rest and handrail assembly for baby carriage. 4,679,806, Cl. 280-47.380.

Ginter, Herbert; Klingel, Reinhard; and Manner, Reinhard, to Degussa Aktiengesellschaft. Method for densification of powdery silica and article formed thereby. 4,680,043, Cl. 65-2.000.

Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., to Wean United Rolling Mills, Inc.; and International Rolling Mill Consultants, Inc. Re-radiating heat shield assembly. 4,680,010, Cl. 432-148.000.

Giordano, Raymond L., to RCA Corporation. Comparator circuit. 4,680,483, Cl. 307-355.000.

Girard, Donald A. Ski stiff in torsion. 4,679,813, Cl. 280-602.000.

Giravions Dorand: *See*—
Mendes, Claude, 4,680,472, Cl. 250-386.000.

Glaser, Eberhard; and Beitinger, Eberhard, to Ed. Zublin Aktiengesellschaft. Method and apparatus for installing panels into recesses in the ground. 4,679,965, Cl. 405-258.000.

Glaser, Robert L., to L. M. Becker & Co., Inc. Multiple chamber automated vending machine. 4,679,684, Cl. 194-350.000.

Glick, Robert E.: *See*—
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, 4,680,149, Cl. 264-2.100.

Glidden Company, The: *See*—
Lin, Ju-Chui; and Abbey, Kirk J., 4,680,354, Cl. 526-172.000.

Glover, Gary H.: *See*—
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.

GMF Robotics Corporation: *See*—
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., 4,679,297, Cl. 29-568.000.

Goding: David J.; and Ramos, Remigio R., to General Motors Corporation. Railway truck with improved steering linkage, detachable suspension and traction motor mounted brake. 4,679,506, Cl. 105-136.000.

Godshall, Mary Ann: *See*—
Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.

Goetter, Erwin H.: *See*—
Krafcik, Joseph T.; Barnes, Richard J.; and Goetter, Erwin H., 4,679,896, Cl. 350-96.200.

Goetze AG: *See*—
Feller, Otto; Brocksieper, Manfred; and Luckger, Rolf, 4,679,472, Cl. 82-19.000.

Gohara, Shinobu: *See*—
Takemura, Tetsuo; and Gohara, Shinobu, 4,680,752, Cl. 370-63.000.

Gold Star Co., Ltd.: *See*—
Kim, Kyo S., 4,679,745, Cl. 242-75.400.

Gold, Thomas P.; and Vogel, John E., to General Motors Corporation. Hydraulic-elastomeric mount displacement decoupler. 4,679,777, Cl. 267-140.100.

Golden Star, Inc.: *See*—
Wilson, Charles G., 4,679,859, Cl. 300-21.000.

Goldenberg, Jill F.: *See*—
McKechnie, Thomas S.; and Goldenberg, Jill F., 4,679,900, Cl. 350-126.000.

Goldman, John G., to Mercury Plastics, Inc. Modular display apparatus for sign panels. 4,679,341, Cl. 40-611.000.

Goldsmith, Wesley R.; and Di Marco, Joel E. Combined primary and secondary sine bars. 4,679,329, Cl. 33-538.000.

Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,680,383, Cl. 530-387.000.

Goletto, Jean: *See*—
Coquard, Jean; and Goletto, Jean, 4,680,379, Cl. 528-336.000.

Goller, Ernst: *See*—
Muller, Adam; and Goller, Ernst, 4,679,413, Cl. 66-125.00R.

Gomez Harlow, James B. 4 Plus double loader. 4,679,343, Cl. 42-87.000.

Gondo, Toyomi: *See*—
Nogi, Teiji; and Gondo, Toyomi, 4,680,663, Cl. 361-2.000.

Gonzalez, Ramon. Table game. 4,679,793, Cl. 273-85.00R.

Goodall, Brian L.; and Grothenhuis, Paulus A. M., to Shell Oil Company. Extraction of Group 8 metals from organic solutions. 4,680,168, Cl. 423-22.000.

Goodman, Steve F.: *See*—
Pettinga, Frederic R.; and Goodman, Steve F., 4,679,368, Cl. 52-36.000.

Goodwin, Joel G.: *See*—
Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., 4,680,524, Cl. 318-696.000.

Goodwin, John C., to Northern Telecom Limited. Laser-fiber positioning method. 4,679,908, Cl. 350-320.000.

Goodyear Tire & Rubber Company, The: *See*—
Candle, Richard D., 4,680,071, Cl. 156-218.000.
Strader, Don S., 4,679,443, Cl. 73-826.000.

Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., to Xerox Corporation. Multipurpose filtering material. 4,680,040, Cl. 55-387.000.

Gora, Hans-Joachim: *See*—
Hoerig, Klaus; and Gora, Hans-Joachim, 4,679,649, Cl. 180-291.000.

Gorka, Robert J.: *See*—
Biletch, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., 4,680,337, Cl. 525-53.000.

Goseberg, Walter; and Pollack, Alfred, to Telefunken Fernseh und Rundfunk GmbH. Coil with magnetisable rod core. 4,680,566, Cl. 336-181.000.

Goss, Larry P.: *See*—
Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., 4,679,934, Cl. 356-43.000.

Gotanda, Motohiro. Door unlocking device. 4,679,834, Cl. 292-169.130.

Gotaverken Arendal AB: *See*—
Bengtsson, Lars; and Sjolander, Johan, 4,679,632, Cl. 166-345.000.

Goto, Kazuyuki: *See*—
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.

Goto, Kenya: *See*—
Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.

Goto, Yasuo; and Adachi, Masao. Eccentric swing gear transmission. 4,679,465, Cl. 74-805.000.

Gotoh, Shiroh: *See*—
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, 4,680,318, Cl. 521-95.000.

Gottling, Helmut: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

Gotzenbrucker, Oswald; and Popp, Gerhard, to Brown, Boveri & Cie AG. Silicon semiconductor component with an edge contour made by an etching technique, and method for manufacturing this component. 4,680,615, Cl. 357-55.000.

Gould Inc.: *See*—
Baker, Richard H.; and Maddox, Edward L., 4,680,490, Cl. 307-575.000.
Uhrey, Marc K., 4,680,485, Cl. 307-463.000.

Goumas, Peter G.; and Wolfe, Paul T., to Lord Corporation. Apparatus and method for handling articles in automated assembly processes. 4,680,523, Cl. 318-685.000.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Tool and method for removing connector housings from terminals mounted on a substrate. 4,679,319, Cl. 29-843.000.

Graco Inc.: *See*—
Harriman, Charles E.; and Nii, Donald S., 4,679,989, Cl. 417-238.000.
Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Graham, Everett S., to Polysar Limited. Agglomeration. 4,680,321, Cl. 523-335.000.

Graham, John P.: *See*—
Cordeiro, Craig A.; and Graham, John P., 4,680,788, Cl. 379-93.000.

Grammer Sitzsysteme GmbH: *See*—
Dotzler, Josef; and Meier, Johann, 4,679,760, Cl. 248-602.000.

Granite State Packing Company, Inc.: *See*—
Sheehy, Roger C.; and Muskat, Irwin, 4,680,186, Cl. 426-129.000.
Sheehy, Roger C.; and Muskat, Irwin, 4,680,187, Cl. 426-129.000.

Gray, Barbara J. Power driven track shoe spike socket wrench. 4,679,468, Cl. 81-121.100.

Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, to Brunswick Corporation. Marine drive shift mechanism with detent canister centered neutral. 4,679,682, Cl. 192-21.000.

Gray, Charles R. W.; and Crawford, Neville, to Garfield Weston Trust for Research into Heart Surgery, Trustees of the; Royal College of Surgeons of England, The; and British Postgraduate Medical Federation. Processes for the production of blood products. 4,680,177, Cl. 424-101.000.

Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., to General Electric Company. Method for reduction of acoustical noise generated by magnetic field gradient pulses. 4,680,545, Cl. 324-307.000.

Gray, Gary L.: *See*—
Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., 4,679,694, Cl. 206-611.000.

Greame, James E.: *See*—
Vollmer, David J.; and Greame, James E., 4,679,767, Cl. 251-129.150.

Greco, Carl C., to Stauffer Chemical Company. Purified catalyst support. 4,680,350, Cl. 526-125.000.

Green, Sidney J.: *See*—
Johnson, Christopher F.; and Green, Sidney J., 4,679,441, Cl. 73-798.000.

Greenberg, Ronald A.: *See*—
Gallagher, Patrick E.; and Greenberg, Ronald A., 4,680,373, Cl. 528-185.000.

Greenwood, Christopher J., to Leyland Vehicles Limited. Driveline for regenerative braking. 4,679,646, Cl. 180-165.000.

Gregory, Mark, to Potterton International Limited. Electrical control unit. 4,679,728, Cl. 237-1.00R.

Gregotsch, Karl: *See*—
Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, 4,680,493, Cl. 310-62.000.

Greigger, Paul P.: *See*—
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Gribshaw, Franklin C.: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,679,574, Cl. 131-365.000.
Grimes, Joseph E.: *See*—
King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., 4,679,951, Cl. 400-110.000.
Grogler, Gerhard: *See*—
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.
Grohe, Klaus, to Bayer Aktiengesellschaft. Preparation of halogenated quinolonecarboxylic acids. 4,680,401, Cl. 546-153.000.
Grooten, Albertus T. M., to N.K.F. Groep B.V. Signal transmission cable. 4,679,898, Cl. 350-96.230.
Grosberg, Percy: *See*—
Porat, Itzchak; Grosberg, Percy; and Moghaddassi, Magid N., 4,679,784, Cl. 271-18.300.
Grosjean, Michel. Multiphase motor with facially magnetized rotor having N/2 pairs of poles per face. 4,680,494, Cl. 310-156.000.
Grote, Paul: *See*—
Michele, Jurgen, 4,679,621, Cl. 165-145.000.
Grothenhuis, Paulus A. M.: *See*—
Goodall, Brian L.; and Grothenhuis, Paulus A. M., 4,680,168, Cl. 423-22.000.
Grove, John A., to United States Steel Corporation. Apparatus for significantly decreasing undesired variation in the alignment of adjustable continuous caster mold walls. 4,679,614, Cl. 164-436.000.
Grover, Wayne D., to Northern Telecom Limited. Terminal address assignment in a broadcast transmission system. 4,680,583, Cl. 340-825.520.
Gruenblat-Nordau, Claudy-Gabrielle: *See*—
Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, 4,680,266, Cl. 435-284.000.
Grumman Aerospace Corporation: *See*—
Mead, Albert R., 4,679,292, Cl. 29-447.000.
GTE Communication Systems, Inc.: *See*—
Boeckmann, Eduard F. B., 4,680,783, Cl. 379-6.000.
GTE Laboratories, Inc.: *See*—
Fallier, Charles N., Jr.; and Lester, James N., 4,680,509, Cl. 315-290.000.
Onorato, Paulette I. K.; and Su, Sophia R., 4,680,049, Cl. 65-18.100.
GTE Products Corporation: *See*—
Fallier, Charles N., Jr.; and Lester, James N., 4,680,509, Cl. 315-290.000.
Landry, Richard E.; and Reed, Joel G., 4,679,623, Cl. 165-166.000.
Mizuhara, Howard, 4,679,960, Cl. 403-272.000.
Ornstein, Jacob L.; and Hydock, Michael A., 4,680,238, Cl. 428-617.000.
Guibert, Alain J. E.; Mestre, Roland R.; and Ritt, Remy P. C., to S.N.E.C.M.A. Turbine ring for a gas turbine engine. 4,679,981, Cl. 415-116.000.
Guilbault, Joseph D., to Stouffer Corporation, The. Combined exercise station and sleeping bed. 4,679,787, Cl. 272-93.000.
Guntly, Thomas G.; and Schultz, Curtis L., to Tecumseh Products Company. Primer for float-type carburetors. 4,679,534, Cl. 123-187.50R.
Gupta, Ashis S.; and Camp, Jerald T., to Coca-Cola Company, The. Process for the extraction of contaminants from plastics. 4,680,060, Cl. 134-26.000.
Gurit-Worbla AG: *See*—
Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, 4,680,198, Cl. 427-164.000.
Gurries & Okamoto, Inc.: *See*—
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., to Gurries & Okamoto, Inc.; and Associated Mechanical Contractors, Inc. Method and apparatus for burning solid waste products using a plurality of multiple hearth furnaces. 4,679,268, Cl. 110-346.000.
Gurteen, Shaun: *See*—
Boddy, Ian; and Gurteen, Shaun, 4,679,758, Cl. 248-479.000.
Gutierrez-Rubio, Joaquin, to Sociedad Anonima de Racionalizacion y Mecanizacion (Sadrym). Apparatus for sizing and peeling longated cylindrical bodies of vegetable matter. 4,679,499, Cl. 99-591.000.
Guzik, Nahum; Mangeym, Gennady; and Jones, James W., to Guzik Technical Enterprises. Motor speed control system. 4,680,516, Cl. 318-326.000.
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Guzik, Nahum; Mangeym, Gennady; and Jones, James W., 4,680,516, Cl. 318-326.000.
H. Stoll GmbH & Co.: *See*—
Muller, Adam; and Goller, Ernst, 4,679,413, Cl. 66-125.00R.
Haas, Roland: *See*—
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.
Habel, Paul A., Jr.; and Kulczycki, Elaine S., to Borg-Warner Corporation. Minimum complexity vibration damper. 4,679,678, Cl. 192-106.200.
Haberland, Siegfried, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,679,993, Cl. 417-490.000.
Hagedorn, Myrna L.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,680,142, Cl. 252-522.00R.
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., to Xerox Corporation. Ink jet compositions and process for preparation thereof. 4,680,332, Cl. 524-377.000.
Haisma, Jan; van der Werf, Pieter; Robertson, John M., deceased; and by de Haan, Freidrich J., administrator, to U.S. Philips Corporation. Component for an integrated optical system. 4,679,892, Cl. 350-96.120.
Hajime Industries Ltd.: *See*—
Lutgendorf, Pieter H.; and Kleinnibbelink, Gerrit J., 4,680,463, Cl. 250-223.00B.
Hakimi, Farhad; Po, Hong; and Snitzer, Elias, to Polaroid Corporation. Optical fiber laser. 4,680,767, Cl. 372-6.000.
Hall, Dwayne A. Fishing line strike indicator. 4,679,345, Cl. 43-17.000.
Halliburton Company: *See*—
Dill, Walter R.; Walker, Michael L.; and Ford, William G. F., 4,679,631, Cl. 166-307.000.
Halloran, Kevin J. Three-sided tip tray. 4,679,691, Cl. 206-557.000.
Ham, Yong S. Baseball exercising device. 4,679,790, Cl. 273-26.00E.
Hamada, Akihiko: *See*—
Yamada, Mikio; and Hamada, Akihiko, 4,679,794, Cl. 273-235.00R.
Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Liquid crystal input/output matrix panel. 4,679,909, Cl. 350-333.000.
Hamada, Hiroshi: *See*—
Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, 4,680,505, Cl. 313-558.000.
Hamar, Martin R. Control system for a continuous cell target readout in a laser measurement system. 4,679,940, Cl. 356-375.000.
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, to Sandoz Ltd. Propenylamines, processes for their production and pharmaceutical compositions containing them. 4,680,291, Cl. 514-183.000.
Hamburger, Jean: *See*—
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.
Hamilton House Marketing, Inc.: *See*—
Leavitt, Michael; and Huls, David S., 4,680,181, Cl. 426-36.000.
Hamilton, Malcolm F., to Hozelock-ASL Ltd. Fluid supply system, a connector and a valve. 4,679,705, Cl. 222-90.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand held electrically selectable labeler. 4,680,081, Cl. 156-384.000.
Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, to Sloan-Kettering Institute for Cancer Research. Process for sex determination in man by use of monoclonal antibodies to the H-Y antigen. 4,680,258, Cl. 435-7.000.
Hammermeister, Dale P.: *See*—
Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., 4,679,422, Cl. 73-38.000.
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Preparation of fluorophthalimides. 4,680,412, Cl. 548-480.000.
Han, Yu-Pin: *See*—
Chan, Tsiu C.; and Han, Yu-Pin, 4,679,300, Cl. 29-571.000.
Hanada, Seigo: *See*—
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Multiplex image reproducing apparatus. 4,679,929, Cl. 355-4.000.
Haneda, Satoshi: *See*—
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,680,625, Cl. 358-80.000.
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, to Horton Manufacturing Co., Inc. Coupling clutch. 4,679,675, Cl. 192-67.00R.
Hanlon, James T.; and Renaut, Paul W., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Relay switch apparatus. 4,680,563, Cl. 335-58.000.
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, to Deseret Medical, Inc. Pressure transducer. 4,679,567, Cl. 128-675.000.
Hanosh, Alan L. Registration device for use in silk screen printing. 4,679,501, Cl. 101-114.000.
Hansen, Dale G. Spare tire carrier. 4,679,717, Cl. 224-42.060.
Hansen, David L.: *See*—
Krutz, Gary; and Hansen, David L., 4,679,488, Cl. 91-1.000.
Hansen, Kolbjorn, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Crusher with rotary plates. 4,679,741, Cl. 241-206.000.
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., to GMF Robotics Corporation. Method for changing the tooling in a robot-based system and system utilizing same. 4,679,297, Cl. 29-568.000.
Harada, Susumu: *See*—
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.
Harada, Yoshiharu: *See*—
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.
Harada, Yoshihito: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., to Marley-Wylain Company, The. Submersible pump and wastewater basin apparatus. 4,679,991, Cl. 417-360.000.
Harbison, Joe A.: *See*—
La Grange, Nyle D.; Nielsen, Darryl M.; and Harbison, Joe A., 4,680,437, Cl. 200-84.00R.
Harbor Branch Oceanographic Institute Inc.: *See*—
Kennedy, Gregory C., 4,680,513, Cl. 318-285.000.

Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., to Inmos Corporation. Method and apparatus for locating soft cells in a ram. 4,680,762, Cl. 371-28.000.

Hardy, Derrick, to Bercorit & Herweg Limited. Valve. 4,679,768, Cl. 251-159.000.

Harken, Olaf T. Mainsail reefing and furling device and method. 4,679,520, Cl. 114-104.000.

Harold Rein: *See*—
Rein, Harold, 4,679,796, Cl. 273-236.000.

Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., to Veeco Integrated Automation Inc. Vehicle to fixed station infrared communications link. 4,680,811, Cl. 455-617.000.

Harriman, Charles E.; and Nii, Donald S., to Graco Inc. Pump shovel bulk unloader. 4,679,989, Cl. 417-238.000.

Harris Corporation: *See*—
Swanson, Hilmer I., 4,680,559, Cl. 333-100.000.
Talmor, Shlomo S., 4,680,535, Cl. 323-312.000.

Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., to Merck & Co., Inc. Substituted caprolactam derivatives as antihypertensives. 4,680,392, Cl. 540-527.000.

Harris, Monty E.; and Sukup, Richard A., to Western Company of North America, The. Hydraulic setting tool. 4,679,624, Cl. 166-120.000.

Harris, Rickey D.: *See*—
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.

Harrison, William M. Method of oil recovery. 4,679,627, Cl. 166-249.000.

Harsco Corporation: *See*—
Johnson, Bruce S., 4,679,771, Cl. 254-273.000.

Hartford, Louise D.: *See*—
Kavoussi, James P.; and Hartford, Louise D., 4,679,943, Cl. 368-12.000.

Hartkopf, Hans-Otto; and Zeller, Christoph, to Siemens Aktiengesellschaft. Light waveguide coupling device. 4,680,809, Cl. 455-601.000.

Hartman, Dennis C.: *See*—
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.

Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG: *See*—
Maier, Andreas, 4,679,971, Cl. 408-145.000.

Hasegawa, Ryoei: *See*—
Tsujimura, Osamu; Hasegawa, Ryoei; and Ohkawa, Masayuki, 4,679,968, Cl. 407-114.000.

Hasegawa, Takeshi: *See*—
Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, 4,680,639, Cl. 358-224.000.

Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, to Kawasaki Jukogyo Kabushiki Kaisha. Vertical roller mill. 4,679,739, Cl. 241-121.000.

Hashimoto, Yasuhiko: *See*—
Katayama, Kaneo; and Hashimoto, Yasuhiko, 4,679,494, Cl. 98-38.600.

Hasircoglu, Alexander W., to Du Pont de Nemours, E. I., and Company. Multiconductor electrical cable terminations and methods and apparatus for making same. 4,679,868, Cl. 439-495.000.

Hassler, George E.: *See*—
Collins, Floyd K.; and Hassler, George E., 4,680,501, Cl. 313-456.000.

Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, to Mitsubishi Chemical Industries Ltd. Optical disc substrate made of a copolycarbonate. 4,680,374, Cl. 528-204.000.

Hata, Seiji: *See*—
Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, 4,680,802, Cl. 382-8.000.

Hatanaka, Keiji: *See*—
Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, 4,679,398, Cl. 60-602.000.

Hattori, Masaichi: *See*—
Morita, Masayuki; and Hattori, Masaichi, 4,679,453, Cl. 74-128.000.

Hattori, Takemi; and Kawamura, Reiki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Side support assembly. 4,679,855, Cl. 297-486.000.

Hattori, Yoshifumi: *See*—
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,680,696, Cl. 346-75.000.

Haussler, Hubert: *See*—
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,679,586, Cl. 137-491.000.

Hawker, Ralph L.; and Spector, George. Electrical switches. 4,680,426, Cl. 174-57.000.

Hawkins, Ronald G., to Aluminum Company of America. Overhead conductor damping device with die cast components and method of making the same. 4,680,424, Cl. 174-42.000.

Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Control system for selectively switchable two/four wheel drive automatic transmission system shifting transfer transmission according to main transmission speed stage. 4,679,450, Cl. 74-752.00A.

Hayashi, Kiyotaka: *See*—
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.

Hayashi, Mitsuroh: *See*—
Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuroh, 4,679,427, Cl. 73-54.000.

Hayes, Cecil E.: *See*—
Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.

Hayes, John, to Tarn-Pure Limited. Water purification apparatus. 4,680,114, Cl. 210-192.000.

Hays, Byron G., to BASF Corporation, Inmont Division. Easily flushable transparent, strong diarylide yellow pigment compositions. 4,680,057, Cl. 106-23.000.

Hazeltine Corporation: *See*—
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.

Heald, Jerry D. Method and apparatus for crack detection and characterization. 4,680,470, Cl. 250-358.100.

Heath, Robert G. Playground construction. 4,679,963, Cl. 405-36.000.

Heck, James V.: *See*—
Christensen, Burton G.; Salzmann, Thomas N.; and Heck, James V., 4,680,292, Cl. 514-210.000.

Heeks, George J.: *See*—
Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., 4,680,040, Cl. 55-387.000.

Heess, Gerhard: *See*—
van Zanten, Anton; Heess, Gerhard; and Geering, Hans P., 4,679,866, Cl. 303-10[illegible].

Hefner, Robert E., Jr., to Dow Chemical Company, The. Cyanate functional maleimide and polyamine copolymer. 4,680,378, Cl. 528-322.000.

Heggie, William S. Engine control systems. 4,679,396, Cl. 60-414.000.

Hehl, Karl. Injection molding machine. 4,680,002, Cl. 425-186.000.

Hehl, Karl. Linear potentiometer for measuring travel. 4,680,570, Cl. 338-176.000.

Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi, 4,679,502, Cl. 101-415.100.

Heile, Bernard J.; and Klos, Terry J., to Ecolab Inc. Method for forming solid detergent compositions. 4,680,134, Cl. 252-160.000.

Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Interferometric methods and apparatus for device fabrication. 4,680,084, Cl. 156-626.000.

Heinze, Helmut; and Wilhelm, Fritz, to Davy McKee A.G. Process for the continuous production of high-molecular polybutyleneterephthalate. 4,680,376, Cl. 528-279.000.

Heldenbrand, Stanley W.; and Chappuis, Clyde L., to Northern Telecom Limited. Cabinet for an electronic apparatus. 4,679,867, Cl. 312-287.000.

Helffer, Bernard; and Scheydecker, Jacques, to Institut Textile de France. Process and installation for transfer and positioning. 4,679,785, Cl. 271-227.000.

Helix Technology Corporation: *See*—
Andeen, Bruce R., 4,679,402, Cl. 62-55.500.
Lessard, Philip A.; Bartlett, Allen J.; and Peterson, John F., 4,679,401, Cl. 62-55.500.

Hellat, Jaan; and Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Pressure wave machine operating as pressure exchanger, in particular for use as the high-pressure compressor for gas turbines. 4,679,393, Cl. 60-39.450.

Helleboid, Jean-Marie: *See*—
Letournel, Michel; Helleboid, Jean-Marie; and Teissier, Claude, 4,680,496, Cl. 310-308.000.

Helmink, Randolph C., to TRW Inc. Method of forming a rotor. 4,680,160, Cl. 419-6.000.

Helvy, Fred A.; and McDonie, Arthur F., to RCA Corporation. Electron discharge device having a narrow range spectral response. 4,680,504, Cl. 313-524.000.

Hemp, Bruce: *See*—
Payne, Donald W.; and Hemp, Bruce, 4,680,689, Cl. 363-26.000.

Hempowitz, Gunter; and Meyer-Kretschmer, Gustav, to Uranit GmbH. Radiation probe for contactless measurement of the surface temperature of an object. 4,679,948, Cl. 374-129.000.

Henderson, Richard C.: *See*—
Chen, John Y.; and Henderson, Richard C., 4,679,303, Cl. 29-571.000.

Hengartner, Urs; and Ramuz, Henri, to Hoffmann-La Roche Inc. Tetrahydronaphthalene derivatives. 4,680,310, Cl. 514-539.000.

Henkin, Melvyn L.; and Laby, Jordan M. Hydrotherapy massage method and apparatus. 4,679,258, Cl. 4-542.000.

Henneberger, Hans, to Siemens Aktiengesellschaft. Hearing aid. 4,680,799, Cl. 381-68.600.

Herbert, Victor. Assay for vitamin B12 deficiency. 4,680,273, Cl. 436-92.000.

Herbst, Kurt: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,679,537, Cl. 123-447.000.

Hercules Incorporated: *See*—
Bard, John K., 4,680,076, Cl. 156-306.900.
Bither, Peter G., 4,680,223, Cl. 428-280.000.
Roach, Donald J., 4,680,248, Cl. 430-270.000.

Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, to Gurit-Worbla AG. Method of producing a scratch resistant coating on a sheet of thermoplastic material. 4,680,198, Cl. 427-164.000.

Hergenroeder, Patrick T. Receptacle for collecting fluids. 4,679,590, Cl. 137-602.000.

Herke, Donald P.: *See*—
Bauer, Theodore J.; Herke, Donald P.; Bork, Edward A.; and Lawson, William E., 4,680,442, Cl. 219-121.0LG.

Herman Miller, Inc.: *See*—
Pettinga, Frederic R.; and Goodman, Steve F., 4,679,368, Cl. 52-36.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Capelle, Gerd, 4,680,152, Cl. 264-40.400.

Herring, Charles. Emergency exit for a personnel chamber. 4,679,365, Cl. 52-204.000.

Herrmann, Rudolf: *See*—
Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, 4,680,493, Cl. 310-62.000.

Herrmann, Ursula: *See*—
Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, 4,679,820, Cl. 280-781.000.

Hess, Heinrich: *See*—
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.

Hesson, David P., to E.I. Du Pont de Nemours and Company. 2-phenyl-4-quinolinecarboxylic acids and pharmaceutical compositions thereof. 4,680,299, Cl. 514-311.000.

Hester, Phillip D.; and Simpson, Richard O., to International Business Machines Corporation. Virtual memory address translation mechanism with combined hash address table and inverted page table. 4,680,700, Cl. 364-200.000.

Hettche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, to BASF Aktiengesellschaft. Stabilizers. 4,680,327, Cl. 524-110.000.

Hetzer, Norbert, to Esselte Pendaflex Corporation. Price cassette. 4,679,339, Cl. 40-10.00R.

Hewlett-Packard Company: *See*—
Dispoto, Gary J.; Mather, Larry R.; and Meyer, John D., 4,680,645, Cl. 358-298.000.
Reames, Stephen P., 4,680,755, Cl. 370-85.000.

Hibst, Hartmut, to BASF Aktiengesellschaft. Preparation of finely divided isotropic ferrite powders having the spinel structure. 4,680,130, Cl. 252-62.600.

Hideo, Tago: *See*—
Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, 4,679,920, Cl. 351-226.000.

Hieber, Konrad; Neppl, Franz; and Schober, Konrad, to Siemens Aktiengesellschaft. Integrated semiconductor circuit including a tantalum silicide diffusion barrier. 4,680,612, Cl. 357-71.000.

Higashizima, Harumi: *See*—
Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, 4,680,116, Cl. 210-282.000.

Highland Laboratories: *See*—
Poitras, James W.; and Wlodyka, Edwin W., 4,679,709, Cl. 222-180.000.

Highton, Frederick J.: *See*—
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.

Hijiya, Toyoto: *See*—
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.

Hillemann, Frank: *See*—
Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.

Hinatase, Fumio: *See*—
Hitomi, Mitsuo; Hinatase, Fumio; and Yuzuriha, Yasuhiro, 4,679,531, Cl. 123-52.0MB.

Hinzpeter, Jurgen; and Schmidt, Ingo, to Wilhelm Fette GmbH. Circular pelletizing machine and method of controlling the same. 4,680,158, Cl. 264-40.500.

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Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.

Hiraizumi, Kazuo: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Hirakoso, Yohei: *See*—
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.

Hirano, Hiroyuki: *See*—
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Hirasawa, Kotaro: *See*—
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.

Hirata, Miyoshi: *See*—
Sakai, Yasuo; and Hirata, Miyoshi, 4,680,274, Cl. 436-512.000.

Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, to Amada Company, Limited. Shearing machine. 4,679,473, Cl. 83-157.000.

Hiratsuka, Seiichiro: *See*—
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,679,929, Cl. 355-4.000.
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,680,625, Cl. 358-80.000.

Hirose, Hujio: *See*—
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.

Hirose, Noboru: *See*—
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.

Hirota, Satoshi; and Nagamine, Kimihiro, to Casio Computer Co., Ltd. Printing apparatus including tab position placement control. 4,679,952, Cl. 400-279.000.

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Hirt, John H., 4,680,004, Cl. 431-5.000.

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Hirzel, Timothy K.: *See*—
Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.

Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, to Ajinomoto Co., Inc. Process for producing N-protected-α-L-aspartyl-L-phenylalanine methyl ester. 4,680,403, Cl. 546-247.000.

Hischke, Marcia, to Uniforms To You & Company. Multi-size jumper dress. 4,679,256, Cl. 2-105.000.

Hitachi, Ltd.: *See*—
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.
Mashino, Keiichi, 4,680,530, Cl. 322-33.000.
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.
Murakami, Toshio, 4,680,624, Cl. 358-44.000.
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.
Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, 4,680,556, Cl. 332-16.00R.
Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, 4,680,802, Cl. 382-8.000.
Nomura, Setsuo; and Isakozawa, Shigeto, 4,680,469, Cl. 250-311.000.
Oishi, Kanji; and Shinoda, Takashi, 4,680,737, Cl. 365-222.000.
Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.
Omoda, Koichiro; and Nagashima, Shigeo, 4,680,730, Cl. 364-900.000.
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.
Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, 4,680,756, Cl. 370-88.000.
Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.
Takemura, Tetsuo; and Gohara, Shinobu, 4,680,752, Cl. 370-63.000.
Uchino, Megumi, 4,680,699, Cl. 364-200.000.
Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, 4,680,507, Cl. 315-111.810.
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.
Watanabe, Naomitsu, 4,680,502, Cl. 313-468.000.
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Hitachi Medical Corporation: *See*—
Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Hitachi Metals, Ltd.: *See*—
Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.

Hitachi, Process Computer Engineering, Inc.: *See*—
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.

Hitchins, William G. Modular building component. 4,679,366, Cl. 52-217.000.

Hitomi, Mitsuo; Hinatase, Fumio; and Yuzuriha, Yasuhiro, to Mazda Motor Corporation. Intake system for internal combustion engine. 4,679,531, Cl. 123-52.0MB.

Hjerten, Stellan. Coating for electrophoresis tube. 4,680,201, Cl. 427-230.000.

Hobourn-Eaton, Ltd.: *See*—
Bristow, Ian T., 4,679,995, Cl. 418-26.000.

Hodge, Isabella A.: *See*—
Tharrington, G. Robert; and Hodge, Isabella A., 4,679,700, Cl. 220-337.000.

Hodgson, Thomas C., to Strong Plastics Limited. Laminating methods and apparatus using resilient faced rollers. 4,680,077, Cl. 156-321.000.

Hodonsky, Joseph W., to General Motors Corporation. Hydraulic mount. 4,679,779, Cl. 267-140.100.

Hodsoll, Raymond J., Jr.: *See*—
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.

Hoechst Aktiengesellschaft: *See*—
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.
Lehmann, Peter; and Michel, Manfred, 4,680,244, Cl. 430-66.000.

Pistorius, Rudolf, 4,680,147, Cl. 260-513.00R.

Hoegerle, Karl: *See—*
Seitz, Karl; Riat, Henri; and Hoegerle, Karl, 4,680,384, Cl. 534-622.000.

Hoerig, Klaus; and Gora, Hans-Joachim, to General Motors Corporation. Motor vehicle engine mounting arrangement. 4,679,649, Cl. 180-291.000.

Hoffmann, Birgit: *See—*
Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.

Hoffmann-La Roche Inc.: *See—*
Cassal, Jean-Marie, 4,680,290, Cl. 514-182.000.
Hengartner, Urs; and Ramuz, Henri, 4,680,310, Cl. 514-539.000.
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,680,415, Cl. 549-214.000.
Reiner, Roland; and Weiss, Urs, 4,680,408, Cl. 548-100.000.

Hofman, Jan. Stabilization aid for a vehicle-or vessel-borne search unit. 4,680,521, Cl. 318-649.000.

Hofstetter, Donald R.; and Fow, Louis F., Jr. Method for forming drum handling rings. 4,680,068, Cl. 156-196.000.

Hogeboom, John G.: *See—*
Theriault, Robert E.; and Hogeboom, John G., 4,679,302, Cl. 29-571.000.

Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., to Warner-Lambert Company. Antibiotic CL-1565 complex derivatives. 4,680,416, Cl. 549-292.000.

Hokuetsu Industries Co., Ltd.: *See—*
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,679,996, Cl. 418-201.000.

Holland, George W.; Maag, Hans; and Rosen, Perry, to Hoffmann-La Roche Inc. Intermediates for 7-fluoro dihydro PGI compounds. 4,680,415, Cl. 549-214.000.

Hollis Automation, Inc.: *See—*
Sedrick, A. Victor, Jr.; and Lowell, Charles R., 4,679,720, Cl. 228-20.000.

Hollis, Craig E.: *See—*
Hollis, Glenn E.; and Hollis, Craig E., 4,679,602, Cl. 141-19.000.

Hollis, Glenn E.; and Hollis, Craig E. Removable device for repeatedly pressurizing a container. 4,679,602, Cl. 141-19.000.

Hollister, Kenneth R.: *See—*
Washburn, William N.; and Hollister, Kenneth R., 4,680,356, Cl. 526-256.000.

Holmes, Gerald E.; and Pace, Jerry E., to Century Wrecker Corporation. Wheel lift towing assembly. 4,679,978, Cl. 414-563.000.

Holmes, Myron L.; and Smolensky, Leo A., to Combustion Engineering, Inc. Fluidized bed reactor having integral solids separator. 4,679,511, Cl. 110-216.000.

Holst, Svend; Jensen, Niels; and Jensen, Georg, to B & J Rocket Rasp A/S. Grinding machine for grinding or rasping of rubber items. 4,679,354, Cl. 51-76.00R.

Holstein und Kappert GmbH: *See—*
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,679,603, Cl. 141-39.000.

Holub, Fred F.: *See—*
Betts, Joseph E.; and Holub, Fred F., 4,680,229, Cl. 428-389.000.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English): *See—*
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Abe, Masao; and Miura, Nobuo, 4,679,540, Cl. 123-602.000.
Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, 4,679,860, Cl. 301-9.0DN.
Komuro, Katsusuke, 4,679,647, Cl. 180-219.000.
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.

Honda Giken Kogyo Kabushikikaisha: *See—*
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.

Honer, William A. Head supported pillow. 4,679,263, Cl. 5-437.000.

Honeywell Inc.: *See—*
Finn, Chris J.; and Youngner, Daniel W., 4,679,308, Cl. 29-576.00B.
Kozlik, Tony J.; and Landini, Bruce J., 4,680,581, Cl. 340-825.060.

Honeywell Information Systems Inc.: *See—*
McCarthy, Daniel M., 4,680,702, Cl. 364-200.000.

Honeywell Ltd.: *See—*
Mejia, Ezequiel, 4,680,582, Cl. 340-825.170.

Hopta, Daniel F., to Storage Technology Corporation. Output driver circuit for LSI and VLSI ECL chips with an active pulldown. 4,680,480, Cl. 307-270.000.

Horiai, Kunio: *See—*
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Horiguchi, Toshio, to Olympus Optical Co., Ltd. Image display apparatus. 4,680,643, Cl. 358-280.000.

Horiuchi, Tetsuro, to Ensci Incorporated. Alumina and alkaline earth metal oxide modified zeolite glass composition. 4,680,277, Cl. 501-27.000.

Horn, Edward R.; and Kot, Norbert J., II, to Aladdin Engineering & Mfg. Mechanical toggle clamp with means for applying uniform clamping force. 4,679,782, Cl. 269-228.000.

Horner, Michael: *See—*
Hettche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, 4,680,327, Cl. 524-110.000.

Horng, Liou-Liang: *See—*
Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.

Hornig, Klaus-Juergen; and Thiessen, Hans-Henning, to Mergenthaler Linotype GmbH. Baseline transposition and character segmenting method for printing. 4,680,578, Cl. 340-731.000.

Horton Manufacturing Co., Inc.: *See—*
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, 4,679,675, Cl. 192-67.00R.

Hoshino, Shiro; and Fujino, Bonpei, to Tomy Kogyo Co. Inc. Toy linkage. 4,680,022, Cl. 446-487.000.

Hosoda, Tooru: *See—*
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Hosono, Masami: *See—*
Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami, 4,679,861, Cl. 301-37.00P.

Hotta, Tomiji: *See—*
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

Houseman, Walter R., to Custom Technical Enterprises. Projectile firing weapon with a replaceable firing mechanism actuator cassette. 4,679,487, Cl. 89-140.000.

Houston, Mary B.: *See—*
Schumacher, Robert W.; and Houston, Mary B., 4,680,189, Cl. 426-285.000.

Hovinga, Donald G., to Schneider Metal Manufacturing Co. Ice cube dispensing outlet. 4,679,715, Cl. 222-517.000.

Howeth, D. Franklin. Shear blade cutting device with adjusting blade alignment compensator. 4,679,604, Cl. 144-34.00E.

Hozelock-ASL Ltd.: *See—*
Hamilton, Malcolm F., 4,679,705, Cl. 222-90.000.

Hubbard, David W.: *See—*
Cruz-Uribe, Antonio S.; Hubbard, David W.; and Raman, Gopalan, 4,680,595, Cl. 346-140.00R.

Huber, Beat: *See—*
Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, 4,680,266, Cl. 435-284.000.

Huber, John H., to AMP Incorporated. Adhesiveless optical fiber connector. 4,679,895, Cl. 350-96.200.

Huchette, Michel: *See—*
Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, 4,680,180, Cl. 426-16.000.

Hughes Aircraft Company: *See—*
Chen, John Y.; and Henderson, Richard C., 4,679,303, Cl. 29-571.000.
Efron, Uzi; and Soffer, Bernard H., 4,679,910, Cl. 350-335.000.
Landecker, Peter B., 4,679,753, Cl. 244-171.000.
Pastor, Ricardo C., 4,680,044, Cl. 65-3.110.
Ramer, O. Glenn, 4,679,893, Cl. 350-96.140.
Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., 4,679,752, Cl. 244-158.00R.

Hughes, John T., to Micropore International Limited. Tubes of microporous thermal insulation material. 4,680,070, Cl. 156-218.000.

Hughes Tool Company: *See—*
Eppink, Jay M., 4,679,638, Cl. 175-107.000.
Leuthen, John M., 4,680,664, Cl. 361-91.000.

Hulett, Terry V.: *See—*
Giles, Grady L.; Wilson, Jesse R.; and Hulett, Terry V., 4,680,760, Cl. 371-21.000.

Hull, Donald R. Set of golf clubs. 4,679,791, Cl. 273-77.00A.

Huls, David S.: *See—*
Leavitt, Michael; and Huls, David S., 4,680,181, Cl. 426-36.000.

Hunt, Oliver L.: *See—*
Dreibelbis, Richard L.; and Hunt, Oliver L., 4,679,998, Cl. 425-72.00S.

Hunts, Rick E. Hair clipper. 4,679,322, Cl. 30-133.000.

Hurley, Timothy R.: *See—*
Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., 4,680,416, Cl. 549-292.000.

Huynh, Anh N.; and Ziogas, Phoivos D., to National Distillers and Chemical Corporation. Ozonator power supply. 4,680,694, Cl. 363-136.000.

Hwa, Chih M.: *See—*
Cuisia, Dionisio G.; and Hwa, Chih M., 4,680,125, Cl. 210-697.000.

Hwang-Change, Tsai. Retractable glare shield device for automobiles. 4,679,842, Cl. 296-97.00G.

Hydock, Michael A.: *See—*
Ornstein, Jacob L.; and Hydock, Michael A., 4,680,238, Cl. 428-617.000.

Hydril Company: *See—*
Burton, James A., 4,679,800, Cl. 277-34.000.

I C Gas International Limited: *See—*
Fitt, Peter W., 4,679,409, Cl. 62-476.000.

Iannella, Vincenzo. Process for preparing 2-[N-2-pyridylcarbomoyl)-methyl]saccharin. 4,680,405, Cl. 546-270.000.

Ichihashi, Hiroo: *See—*
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,680,696, Cl. 346-75.000.

Ichinohe, Shoji: *See—*
Tanaka, Masaki; and Ichinohe, Shoji, 4,680,366, Cl. 528-27.000.

ICI Australia Limited: *See—*
Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., 4,680,400, Cl. 546-141.000.

Ida, Shuichiro: *See*—
Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, 4,679,449, Cl. 74-12.000.

Ide, Fumito: *See*—
Sogo, Toshiyuki; and Ide, Fumito, 4,679,927, Cl. 355-3.00R.

Idemitsu Kosan Company Limited: *See*—
Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, 4,680,353, Cl. 526-160.000.
Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, 4,680,054, Cl. 71-93.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.

IEL Limited: *See*—
Mandal, Arun K.; Jawalkar, Damodar G.; and Mahajan, Satish W., 4,680,418, Cl. 549-305.000.

Igaki, Tetsuo: *See*—
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Iida, Yuji, to Tokyo Electric Co., Ltd. Electronic cash register and method for defining print characters. 4,680,707, Cl. 364-405.000.

Ikeda, Hidekatsu: *See*—
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157.000.

Ikeda, Mitsuhiro; and Nakao, Yasuo, to Nippon Air Brake Co., Ltd. Emergency brake command read-convert device for railway train having cars with pneumatic and cars with electrical brake control. 4,679,863, Cl. 303-3.000.

Ikeda, Toshiya: *See*—
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.

Ikeda, Yoshinori; and Aoki, Takao, to Canon Kabushiki Kaisha. Image forming device for reproducing a half-tone image. 4,680,646, Cl. 358-298.000.

Ikejiri, Masahisa: *See*—
Osafune, Haruo; Kanbe, Sadao; Mori, Teiichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.

Ikeuchi, Satoshi; and Taniguchi, Ikuo, to Fujitsu Limited. Protection switching system for carrier transmission line. 4,680,776, Cl. 375-40.000.

Ikoma, Hideto: *See*—
Shibahara, Yoshihiko; and Ikoma, Hideto, 4,680,253, Cl. 430-504.000.

Ilik, Barbara D. Infusion package. 4,680,185, Cl. 426-83.000.

Imai, Eiichi: *See*—
Suematsu, Koshi; and Imai, Eiichi, 4,680,245, Cl. 430-110.000.

Imai, Kaetsu, to Victor Company of Japan, Limited. Drive mechanism having torque transmitting gear assemblies. 4,680,659, Cl. 360-96.300.

Imamura, Masanaga; and Mizuno, Isao, to Ricoh Co., Ltd. Image formation method subliming ink through a gas permeable membrane. 4,680,592, Cl. 346-1.100.

Imanaka, Hiroshi: *See*—
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.

Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, to Fujitsu Limited. Process for producing multilayer ceramic circuit board with copper. 4,679,320, Cl. 29-848.000.

Imaseki, Takashi: *See*—
Ozaki, Kiyotaka; Torii, Shuuji; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.

Immunomedics, Inc.: *See*—
Sundoro, Boby M., 4,680,338, Cl. 525-54.100.

Imoto, Takumi: *See*—
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Imperial Chemical Industries Plc: *See*—
Kenyon, Ronald W.; and Thorp, Derek, 4,680,417, Cl. 549-299.000.
Lowe, Barrie M.; and Fegan, Stuart G., 4,680,170, Cl. 423-329.000.
Rochefort, Malcolm P.; and Wood, Richard, 4,680,155, Cl. 264-73.000.

Inada, Shunji: *See*—
Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, 4,680,756, Cl. 370-88.000.

Inagaki, Hiromichi. Water-proof container. 4,679,724, Cl. 229-4.500.

Inami, Sumiaki: *See*—
Momoi, Shoji; and Inami, Sumiaki, 4,679,286, Cl. 29-33.00P.

Inco Alloys International, Inc.: *See*—
Orlando, John J., 4,679,736, Cl. 241-25.000.

Indak Manufacturing Corp.: *See*—
Raab, Andrew F.; and Cobb, Albert R., III, 4,679,588, Cl. 137-560.000.

Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Fluid pressure controlling solenoid valve. 4,679,589, Cl. 137-596.170.

Indiana Mills & Manufacturing, Inc.: *See*—
Anthony, James R.; and Lortz, Allan R., 4,679,852, Cl. 297-464.000.

Indicator Controls Corporation: *See*—
Martin, Marshall H., 4,680,717, Cl. 364-436.000.

Injet Medical Products, Inc.: *See*—
Parsons, James S.; and Gasaway, Jack S., 4,680,027, Cl. 604-68.000.

Inmos Corporation: *See*—
Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., 4,680,762, Cl. 371-28.000.

Inmos Limited: *See*—
Edwards, Jonathan; Waller, David L.; and May, Michael D., 4,680,698, Cl. 364-200.000.

Inoko, Kenji, to AB Tetra Pak. Accumulating commodity conveyor. 4,679,685, Cl. 198-461.000.

Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Image forming optical apparatus. 4,679,902, Cl. 350-167.000.

Inou, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, to Yokogawa Hokushin Electric Corporation. DC/DC converter. 4,680,688, Cl. 363-21.000.

Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, to Kabushiki Kaisha Toshiba. Process for preparing aluminum nitride powder. 4,680,278, Cl. 501-98.000.

Inoue MTP Kabushiki Kaisha: *See*—
Matsuda, Hiromichi, 4,680,150, Cl. 264-26.000.

Inoue, Naohiko: *See*—
Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, 4,679,809, Cl. 280-91.000.

Inoue, Osamu: *See*—
Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, 4,680,505, Cl. 313-558.000.

Inoue, Tadashi: *See*—
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.

Insituform Group Limited: *See*—
Wood, Eric, 4,680,066, Cl. 156-156.000.

Instance, David J. Apparatus for producing labels. 4,680,080, Cl. 156-357.000.

Institut for Energetik - Zentralstelle fur Rationelle Energieanwendung: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.

Institut National de la Sante et de la Recherche Medicale: *See*—
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Institut Textile de France: *See*—
Helffer, Bernard; and Scheydecker, Jacques, 4,679,785, Cl. 271-227.000.

Institute Problem Modelirovania v Energetike a An USSR: *See*—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Instrumentarium Corp.: *See*—
Tanttu, Jukka, 4,680,549, Cl. 324-318.000.

Intel Corporation: *See*—
Khurana, Neeraj, 4,680,635, Cl. 358-211.000.

Interferon Sciences, Inc.: *See*—
Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, 4,680,175, Cl. 424-85.000.

Intermedics, Inc.: *See*—
Baker, Ross G., Jr., 4,679,572, Cl. 128-786.000.

International Business Machines Corporation: *See*—
Chang, Phillip, 4,679,527, Cl. 118-658.000.
Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., 4,680,524, Cl. 318-696.000.
Duforestel, Guy G.; Lechaczynski, Michel A.; Poiraud, Clement Y.; and Viallon, Paul P., 4,680,733, Cl. 364-900.000.
Flamholz, Alexander L., 4,679,938, Cl. 356-237.000.
Hester, Phillip D.; and Simpson, Richard O., 4,680,700, Cl. 364-200.000.
Kriz, Thomas A., 4,680,703, Cl. 364-200.000.
Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., 4,680,653, Cl. 360-72.200.
Shu, Nan-Chiang, 4,680,705, Cl. 364-300.000.
Tsai, Mon Y., 4,680,539, Cl. 324-73.00R.

International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,680,142, Cl. 252-522.00R.

International Hydron Corporation: *See*—
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, 4,680,149, Cl. 264-2.100.

International Rolling Mill Consultants, Inc.: *See*—
Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., 4,680,010, Cl. 432-148.000.

International Shoe Machine Corporation: *See*—
Becka, Michael M.; and Vornberger, Walter, 4,679,269, Cl. 12-10.500.

Interox Chemicals Limited: *See*—
Williams, John, 4,680,271, Cl. 436-55.000.

Intravascular Surgical Instruments, Inc.: *See*—
Kensey, Kenneth; and Nash, John, 4,679,558, Cl. 128-328.000.

Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, to Kyorin Pharmaceutical Co., Ltd. Pyrazolo[1,5-a]pyridines and benzimidazoles, useful as antiallergic agents. 4,680,398, Cl. 546-121.000.

Irmscher, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Sulfur-containing 6-ketoprostaglandins. 4,680,288, Cl. 514-63.000.

Irving, Graeme N.: *See*—
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,680,132, Cl. 252-108.000.

Irwin, Lawrence: *See*—
Anderson, Paul T.; and Irwin, Lawrence, 4,679,378, Cl. 53-405.000.

Isaacs, Theodore M.: *See*—
Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., 4,679,752, Cl. 244-158.00R.

Isakozawa, Shigeto: *See*—
Nomura, Setsuo; and Isakozawa, Shigeto, 4,680,469, Cl. 250-311.000.

Iseki, Yuji: *See*—
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.

Ishida, Hiroshi: *See*—
Kobari, Katsuo; and Ishida, Hiroshi, 4,680,525, Cl. 318-798.000.

Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, to Idemitsu Kosan Company Limited. Process for production of styrene polymers. 4,680,353, Cl. 526-160.000.

Ishii, Hiroshi: *See*—
Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, 4,680,720, Cl. 364-521.000.

Ishii, Susumu; and Oda, Kiyoshi, to Yoshida Kogyo K. K. Automatic locking slider with a pair of pull tabs. 4,679,281, Cl. 24-422.000.

Ishikawa, Haruyuki: *See*—
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, 4,680,520, Cl. 318-594.000.

Ishikawa, Masanobu: *See*—
Nishikawa, Masumi; and Ishikawa, Masanobu, 4,679,457, Cl. 74-441.000.

Ishikawa, Tatsuo: *See*—
Yuhara, Yukitomo; Okojima, Sumio; and Ishikawa, Tatsuo, 4,679,576, Cl. 132-82.00R.

Ishitani, Tohru: *See*—
Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, 4,680,507, Cl. 315-111.810.

Ishiwata, Shousuke: *See*—
Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuroh, 4,679,427, Cl. 73-54.000.

Ishiwatari, Shiro, to Olympus Optical Co., Ltd. Electrophoretic apparatus. 4,680,102, Cl. 204-299.00R.

Ishizaka, Yutaka: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.

Iskandarani, Ziad: *See*—
Miller, Theodore E., Jr.; and Iskandarani, Ziad, 4,679,428, Cl. 73-61.10C.

Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, to Nippon Hoso Kyokai. Viewfinder for TV camera use with means for enhancing the contrast level of the viewfinder image. 4,680,639, Cl. 358-224.000.

Isoo, Osamu: *See*—
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Isoroy: *See*—
Vernois, Michel; and Paugam, Francois, 4,680,219, Cl. 428-222.000.

Isoyama, Toyoshiro; Ogawa, Tetsuya; and Sugimori, Shigeru, to Chisso Corporation. Liquid crystal ester compound. 4,680,137, Cl. 252-299.620.

Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., to General Electric Company. False triggering protection for switching device of a capacitive load pulser circuit. 4,680,532, Cl. 323-240.000.

Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., to General Electric Company. Protection arrangement for switching device of a capacitive load pulser circuit. 4,680,533, Cl. 323-240.000.

Itek Corporation: *See*—
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111.000.

Ito, Ken; and Kawabe, Taketoshi, to Nissan Motor Co., Ltd. Vehicle motion estimating system. 4,679,808, Cl. 280-91.000.

Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, to Nissan Motor Co., Ltd. Steering control system for wheeled vehicle. 4,679,809, Cl. 280-91.000.

Ito, Ryoichi: *See*—
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, 4,680,318, Cl. 521-95.000.

Ito, Takeshi, to Tokyo Shibaura Denki Kabushiki. Device for detecting a space between adjacent blocks of data recorded in a recording medium. 4,680,652, Cl. 360-72.100.

Itoh, Katsuro: *See*—
Yoshino, Teruo; and Itoh, Katsuro, 4,680,691, Cl. 363-51.000.

Itoh, Yoshitaka: *See*—
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.

Itoh, Yuji; and Takahashi, Junichi, to Canon Kabushiki Kaisha. Ophthalmic photographic apparatus. 4,679,919, Cl. 351-206.000.

Iwai, Kazuo, to Ajinomoto Co., Inc. Acceleration of lipid metabolism using vanillylamine derivatives. 4,680,313, Cl. 514-627.000.

Iwaki, Akihiro, to Stanley Electric Co., Ltd. Lighting fixture for vehicle. 4,680,678, Cl. 362-61.000.

Iwaki, Akihiro; and Tajima, Masayoshi, to Stanley Electric Co., Ltd. Combination vehicle lamp device. 4,680,680, Cl. 362-80.000.

Iwamoto, Hirofumi: *See*—
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Iwanaga, Hironobu: *See*—
Aoki, Motohisa; and Iwanaga, Hironobu, 4,680,246, Cl. 430-133.000.

Iwashita, Tooru: *See*—
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.

Iwata, Masatoshi: *See*—
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.

Iwata, Shuji: *See*—
Fukushima, Nobuo; and Iwata, Shuji, 4,680,629, Cl. 358-147.000.

Iwatani, Shiro: *See*—
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.

Izotova, Lara S.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Izumi, Hideki D.; and Terrell, Paul J., to Romox Incorporated. Reprogrammable cartridge memory with built-in identification circuitry and programming method. 4,680,731, Cl. 364-900.000.

J. C. Bamford Excavators Limited: *See*—
Brocklebank, Norman; and Cooper, Alan, 4,679,336, Cl. 37-103.000.

J. M. Huber Corporation: *See*—
Kunkle, Albert C.; and Maxwell, Edgar J., III, 4,680,104, Cl. 204-300.00R.

J. T. Baker Chemical Company: *See*—
Ramsden, Hugh E.; and Patterson, Joseph M., 4,680,120, Cl. 210-635.000.
Ramsden, Hugh E.; and Patterson, Joseph M., III, 4,680,121, Cl. 210-635.000.

Jabs, Alfred: *See*—
Wohrl, Bernhard; and Jabs, Alfred, 4,679,619, Cl. 165-81.000.

Jacaruso, Gary J., to United Technologies Corporation. Method for stabilizing thick honeycomb core composite articles. 4,680,216, Cl. 428-116.000.

Jack Walters & Sons, Corp.: *See*—
Geisthardt, Alan C., 4,679,367, Cl. 52-233.000.

Jackson, Charles L., to AMP Incorporated. Electrical terminal. 4,679,887, Cl. 439-849.000.

Jackson, Robert W.: *See*—
Kosarski, Raymond, Jr.; and Jackson, Robert W., 4,679,397, Cl. 60-562.000.

Jacob, Neil R.; and Suiter, John R., to Smiths Industries Public Limited Company. Probe assemblies including such mounts. 4,679,431, Cl. 73-290.00R.

Jacobs, Stephen D.; and Cerqua, Kathleen A., to University of Rochester, The. Optical apparatus using liquid crystals for shaping the spatial intensity of optical beams having designated wavelengths. 4,679,911, Cl. 350-347.00E.

Jahnke, Andreas, to Siemens Aktiengesellschaft. Magnetic field device for a system for the acceleration and/or storage of electrically charged particles. 4,680,565, Cl. 335-216.000.

James, Claude: *See*—
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,680,303, Cl. 514-336.000.

James, Thomas A.: *See*—
Spratt, Kenneth, 4,679,415, Cl. 70-118.000.

Jameson, Calvin R.; and Ramazzotti, Dario J., to Nordson Corporation. Hot melt foam adhesive system. 4,679,710, Cl. 222-190.000.

Jannoni, Richard: *See*—
Coates, Fredrica V.; Jannoni, Richard; and Orsini, Jean, 4,680,030, Cl. 604-391.000.

Janowicz, Andrew H.; and Melby, Lester R., to Du Pont de Nemours, E. I., and Company. Cobalt (II) chelates as chain transfer agents in free radical polymerizations. 4,680,352, Cl. 526-147.000.

Japan Steel Works, Ltd., The: *See*—
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.

Japan Tobacco Inc.: *See*—
Yamaguchi, Katsunori; and Takemoto, Nagaaki, 4,679,575, Cl. 131-365.000.

Jarr, Klaus D., to Marley-Wylain Company, The. Leak detector with two stage piston chamber. 4,679,587, Cl. 137-509.000.

Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., to Damon Biotech, Inc. Induction of immune response by immunization with encapsulated antigen-producing cells. 4,680,174, Cl. 424-85.000.

Jasinski, Richard A.; and Mains, Donald M., to Becor Western Inc. Automatic leveling system for blast hole drills and the like. 4,679,489, Cl. 91-36.000.

JATAB, Jan Torgny AB: *See*—
Torgny, Jan, 4,679,849, Cl. 297-330.000.

Jawalkar, Damodar G.: *See*—
Mandal, Arun K.; Jawalkar, Damodar G.; and Mahajan, Satish W., 4,680,418, Cl. 549-305.000.

Jean Greub S.A.: *See*—
Lopez, Angel, 4,679,295, Cl. 29-564.800.

Jean, Robert P. H.: *See*—
Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., 4,680,671, Cl. 361-329.000.

Jee, Trevor P., to British Petroleum Company p.l.c., The. Subsea pipeline bundle. 4,679,598, Cl. 138-103.000.
Jefferts, Keith B., to Northwest Marine Technology Inc. Method and device for tagging a macro-organism. 4,679,559, Cl. 128-330.000.
Jeffreys, Lyman W.: *See—*
Sieradzki, Christopher; and Jeffreys, Lyman W., 4,679,447, Cl. 73-865.800.
Jeindl, Ferdinand, to Steirische Kettenfabriken Pengg-Walenta KG. Vehicle tire chain. 4,679,608, Cl. 152-213.00A.
Jendick, Manfred, to GerroKaiser Dosenwerk GmbH & Co KG. Method and apparatus for lubricating a moving chain. 4,679,659, Cl. 184-15.200.
Jennings, Alfred R., Jr.: *See—*
Abdo, Milton K.; and Jennings, Alfred R., Jr., 4,679,629, Cl. 166-281.000.
Jennmar Corporation: *See—*
Yacisin, Paul A., 4,679,966, Cl. 405-261.000.
Jensen, Borge: *See—*
Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.
Jensen, Brian D.: *See—*
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., 4,679,857, Cl. 299-37.000.
Jensen, C. Allen: *See—*
Lang, Paul W.; and Gribshaw, Franklin C., 4,679,574, Cl. 131-365.000.
Jensen, Georg: *See—*
Holst, Svend; Jensen, Niels; and Jensen, Georg, 4,679,354, Cl. 51-76.00R.
Jensen, Niels: *See—*
Holst, Svend; Jensen, Niels; and Jensen, Georg, 4,679,354, Cl. 51-76.00R.
Jeschke, Willi, to Heidelberger Druckmaschinen AG. Register system for in-register alignment or orientation of a flexible printing plate. 4,679,502, Cl. 101-415.100.
Jeumont-Schneider Corporation: *See—*
Marchand, Patrick, 4,680,586, Cl. 340-870.260.
JGC Corporation: *See—*
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.
Jilken, Ann-Christin, to Adenco Engineering AB. Profile. 4,679,371, Cl. 52-574.000.
Jindo, Tomio: *See—*
Ozaki, Kiyotaka; Torii, Shuuji; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.
Jobst, Wolfgang: *See—*
Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.
Joerns Healthcare, Inc.: *See—*
Packard, Richard F.; and Cover, Kenneth R., 4,680,790, Cl. 379-432.000.
Johannessen, Jorgen M., to Jorgen Mosbaek Johannessen ApS. Device for controlling the flow in a pipe system. 4,679,595, Cl. 137-813.000.
Johansen, Kim L. Alarm device for automobiles and similar vehicles. 4,679,648, Cl. 180-272.000.
Johansson, Gert A. Clothing data marker. 4,679,340, Cl. 40-322.000.
John, Gunther, to Minnesota Mining and Manufacturing Company. Fire resistant cast cable connection. 4,680,427, Cl. 174-88.00R.
Johns Hopkins University, The: *See—*
Loveless, John H., 4,679,644, Cl. 180-6.500.
Small, Thomas R., 4,679,761, Cl. 248-609.000.
Johnson, Alfred N.: *See—*
Prisco, Anthony J.; and Johnson, Alfred N., 4,679,738, Cl. 241-101.200.
Johnson, Brian S., to Upjohn Company, The. Stable prostaglandin E gels utilizing colloidal silicon dioxide as a gel-forming agent. 4,680,312, Cl. 514-573.000.
Johnson, Bruce S., to Harsco Corporation. Cable tension sensing apparatus. 4,679,771, Cl. 254-273.000.
Johnson, Christopher F.; and Green, Sidney J., to Terra Tek, Inc. Pressure balanced loading piston for triaxial test cells. 4,679,441, Cl. 73-798.000.
Johnson, Clifford T.: *See—*
Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., 4,680,759, Cl. 370-112.000.
Johnson, Conner. Convertible auto restrainer seat (car set). 4,679,804, Cl. 280-30.000.
Johnson, Daniel D., to W. L. Gore & Associates, Inc. Dielectric materials. 4,680,220, Cl. 428-241.000.
Johnson, David D.: *See—*
Biller, Cleveland J.; and Johnson, David D., 4,679,803, Cl. 280-6.00H.
Johnson, Jay K.: *See—*
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.
Johnson, Michael R.: *See—*
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,680,404, Cl. 546-269.000.
Johnston Pump/General Valve, Inc.: *See—*
Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., 4,679,764, Cl. 251-14.000.
Jolly, Thomas A. Gun sight. 4,679,344, Cl. 42-100.000.
Jones, Douglas L.: *See—*
Bryson, Charles E., III; and Jones, Douglas L., 4,680,467, Cl. 250-305.000.
Jones, James E.: *See—*
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.
Jones, James W.: *See—*
Guzik, Nahum; Mangeym, Gennady; and Jones, James W., 4,680,516, Cl. 318-326.000.
Jones, John H.: *See—*
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.
Jones, Ralph W.: *See—*
Maskasky, Joe E.; and Jones, Ralph W., 4,680,256, Cl. 430-567.000.
Jones, Richard J.: *See—*
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111.000.
Jorgen Mosbaek Johannessen ApS: *See—*
Johannessen, Jorgen M., 4,679,595, Cl. 137-813.000.
Joslin, Paul C.: *See—*
Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., 4,680,801, Cl. 382-3.000.
Josquin, Wilhelmus J. M. J.: *See—*
Lohstroh, Jan; and Josquin, Wilhelmus J. M. J., 4,680,619, Cl. 357-86.000.
Jourdain, Gerard E. A.: *See—*
Bouiller, Jean G.; and Jourdain, Gerard E. A., 4,679,982, Cl. 415-145.000.
Junior, Aluizio P.: *See—*
Ghosh, Subir; and Junior, Aluizio P., 4,680,558, Cl. 333-21.00R.
JWG Enterprises: *See—*
Waltman, John H.; Stewart, Wesley J.; and Leroux, Gerald E., 4,679,543, Cl. 126-25.00R.
Kabushiki Kaisha Daikin Seisakusho: *See—*
Nagano, Tamio, 4,679,683, Cl. 192-89.00B.
Kabushiki Kaisha Daini Seikosha: *See—*
Kawahara, Yukito, 4,680,580, Cl. 340-784.000.
Kabushiki Kaisha Daisei Kikai: *See—*
Kawakami, Sanji, 4,679,641, Cl. 177-114.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kodama, Kazuo; and Morikawa, Keishi, 4,679,973, Cl. 409-200.000.
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.
Kabushiki Kaisha Meidensha: *See—*
Nogi, Teiji; and Gondo, Toyomi, 4,680,663, Cl. 361-2.000.
Kabushiki Kaisha Sankodo: *See—*
Kobayashi, Hiroshi, 4,679,671, Cl. 190-115.000.
Kabushiki Kaisha Sato: *See—*
Kashiwaba, Tadao, 4,680,083, Cl. 156-510.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Morita, Masayuki; and Hattori, Masaichi, 4,679,453, Cl. 74-128.000.
Kabushiki Kaisha Toshiba: *See—*
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,680,278, Cl. 501-98.000.
Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.
Kobayashi, Koichi, 4,680,748, Cl. 369-77.100.
Kubota, Yousuke, 4,679,442, Cl. 73-861.120.
Miyamoto, Junichi; and Tsujimoto, Jun-ichi, 4,680,735, Cl. 365-210.000.
Morizuka, Kouhei, 4,679,305, Cl. 29-576.300.
Nakagawa, Akio; and Watanabe, Kiminori, 4,680,604, Cl. 357-23.400.
Ooi, Kazushige, 4,680,636, Cl. 358-213.180.
Sagoi, Masayuki; and Nishikawa, Reiji, 4,680,197, Cl. 427-129.000.
Sakai, Takami, 4,680,692, Cl. 363-35.000.
Sasaki, Hiroshi, 4,679,565, Cl. 128-660.000.
Sogo, Toshiyuki; and Ide, Fumito, 4,679,927, Cl. 355-3.00R.
Sugiki, Tadashi, 4,680,637, Cl. 358-213.260.
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.
Tanaka, Yoshio; and Onodera, Toshihiro, 4,680,534, Cl. 323-290.000.
Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.
Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, 4,680,720, Cl. 364-521.000.
Yoshino, Teruo; and Itoh, Katsuro, 4,680,691, Cl. 363-51.000.
Kabushiki Kaisha Universal: *See—*
Okada, Kazuo, 4,679,789, Cl. 273-1.00E.
Kackman, Gerald M.: *See—*
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., 4,680,704, Cl. 364-525.000.
Kagabu, Shinzo: *See—*
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.
Kage, Kouzou, to NEC Corporation. Digital signal repeater including means for controlling a transmitter. 4,680,772, Cl. 375-4.000.
Kageyama, Yoshiteru, to Mitsubishi Petrochemical Company Limited. Metal powder-containing compositions. 4,680,140, Cl. 252-512.000.
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cutter for dispensing container and dispensing container provided with said cutter. 4,679,718, Cl. 225-48.000.

Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, to Mitsui Toatsu Chemicals, Incorporated. Sulfur-containing polyurethane base lens resin. 4,680,369, Cl. 528-76.000.

Kakavas, Dorothy A., to Aadams Merchandising, Inc. Display table attachment for shopping carts. 4,679,818, Cl. 280-33.99A.

Kalb, Gerald F.; and Brown, David M., to S.I.E., Inc. Shock absorber. 4,679,669, Cl. 188-375.000.

Kalriess, William: *See*—
Magid, David J.; Svitila, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.

Kambic, Raymond V., to R. R. Brink Locking Systems, Inc. Trigger and latch bolt assembly. 4,679,416, Cl. 70-143.000.

Kamehara, Nobuo: *See*—
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.

Kamen, Dean L., to Baxter Travenol Laboratories, Inc. Fluid drop detection system. 4,680,462, Cl. 250-222.100.

Kamigaito, Masayuki: *See*—
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Kamihonoki, Masuo: *See*—
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

Kaminski, Ronald S.: *See*—
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.

Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, to Matsushita Electric Industrial Co., Ltd. Water purifier apparatus. 4,680,116, Cl. 210-282.000.

Kamiyama, Koozi: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.

Kammermeier, Anton: *See*—
Moser, Ludwig M.; and Kammermeier, Anton, 4,679,650, Cl. 181-130.000.

Kamoun, Ahmed: *See*—
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve ; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.

Kamyr AB: *See*—
Ahs, Bjorn, 4,680,108, Cl. 209-273.000.

Kanai, Junichi: *See*—
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,679,996, Cl. 418-201.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Disc player having pick-up tilt servo system combined with disc presence detection circuits. 4,680,744, Cl. 369-44.000.

Kanamori, Toshinori: *See*—
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.

Kanbe, Sadao: *See*—
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.
Osafune, Haruo; Kanbe, Sadao; Mori, Teiichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.

Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuroh, to Chichibu Cement Kabushiki Kaisha. Apparatus for measuring viscosity. 4,679,427, Cl. 73-54.000.

Kaneda, Kazuhisa: *See*—
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Asada, Masahiro; and Azuma, Miyuki, 4,680,381, Cl. 528-501.000.
Uku, Kyouji; and Kato, Shinji, 4,680,320, Cl. 523-313.000.

Kaneko, Hiroshi: *See*—
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.

Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, to Diafoil Company, Limited. Polyester film for magnetic recording media. 4,680,217, Cl. 428-141.000.

Kaneshige, Noritsugu: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.

Kaneyuki, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Auxiliary device driving unit driven by a vehicle engine. 4,679,456, Cl. 74-752.00D.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, 4,679,673, Cl. 192-21.000.

Kanzaki Paper Manufacturing Co. Ltd.: *See*—
Okamoto, Shigeo; and Shiozaki, Tomoharu, 4,680,597, Cl. 503-214.000.

Kapadia, Jayant K.: *See*—
Fruehan, Mark T.; Fennig, Jeffrey A.; and Kapadia, Jayant K., 4,679,508, Cl. 105-341.000.

Kaplan, Murray A.; Bogardus, Joseph B.; and Lipper, Robert A., to Bristol-Myers Company. Temperature stable crystalline di(1-methyl-2-pyrralidinone) and di(N-formylpyrrolidine) adducts of cephalosporin derivatives. 4,680,389, Cl. 540-222.000.

Karl, David: *See*—
Petratos, Nickie A.; Karl, David; and Bradford, William M., 4,680,676, Cl. 361-424.000.

Karr, Steven G.: *See*—
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Karwoski, Stanley G.: *See*—
Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, to Kabushiki Kaisha Toshiba. Objective lens driving device. 4,679,903, Cl. 350-247.000.

Kasai, Yoshihiko: *See*—
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Kashihara, Yoshihiko: *See*—
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157.000.

Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Cutter device for a film strip on a laminate. 4,680,083, Cl. 156-510.000.

Kasper, Joseph G.: *See*—
Field, Bruce F.; and Kasper, Joseph G., 4,679,271, Cl. 15-49.00C.

Katakura, Kageyoshi: *See*—
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Katayama, Kaneo; and Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Damper device for an air conditioning apparatus. 4,679,494, Cl. 98-38.600.

Kato, Hideaki; and Araki, Shigeru, to NEC Corporation. Digital video signal process apparatus for use in a video tape recorder. 4,680,791, Cl. 380-8.000.

Kato, Hitoshi: *See*—
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Kato, Masaie: *See*—
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.

Kato, Shinji: *See*—
Uku, Kyouji; and Kato, Shinji, 4,680,320, Cl. 523-313.000.

Katsuhiko, Kobayashi: *See*—
Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, 4,679,920, Cl. 351-226.000.

Kauss, Wolfgang, to Mannesmann Rexroth GmbH. Method for depth adjustment of a tilling machine. 4,679,633, Cl. 172-1.000.

Kavoussi, James P.; and Hartford, Louise D. Scent clock bimetallic device. 4,679,943, Cl. 368-12.000.

Kawabe, Taketoshi: *See*—
Ito, Ken; and Kawabe, Taketoshi, 4,679,808, Cl. 280-91.000.

Kawabe, Taketosi: *See*—
Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, 4,679,809, Cl. 280-91.000.

Kawahara, Yukito, to Kabushiki Kaisha Daini Seikosha. Active matrix-addressed liquid-crystal display device. 4,680,580, Cl. 340-784.000.

Kawai, Hidemi: *See*—
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.

Kawai, Masanobu. Baker's dough. 4,680,182, Cl. 426-62.000.

Kawai, Masao: *See*—
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,679,478, Cl. 84-1.100.

Kawai, Tatsundo: *See*—
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Kawai, Yoshio: *See*—
Sugiyama, Kazuhiro; and Kawai, Yoshio, 4,680,432, Cl. 200-5.00A.

Kawakami, Sanji, to Kabushiki Kaisha Daisei Kikai. Apparatus for feeding sprouting beans or the like in fixed quantities. 4,679,641, Cl. 177-114.000.

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera. 4,679,925, Cl. 354-173.100.

Kawamura, Reiki: *See*—
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.

Kawanishi, Tsuneaki: *See*—
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Kawano, Katsumi: *See*—
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.
Nishida, Hiroshi, 4,679,522, Cl. 114-357.000.
Yazaki, Mitsuhiro, 4,680,575, Cl. 340-624.000.

Kawasaki Steel Corporation: *See*—
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Kawase, Kiyotaka: *See*—
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Kawashima, Kazuyasu: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Ta-

keya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Kearney, David A., to Markem Corporation. Label applicator. 4,680,082, Cl. 156-497.000.

Kearney & Trecker Corporation: *See*—
Lohneis, Earl R.; and Woythal, Robert T., 4,679,970, Cl. 408-128.000.

Keeton, J. Herbert. Process and apparatus for stitching excess thread chain on a sewing machine. 4,679,515, Cl. 112-262.100.

Keiper Recaro GmbH & Co.: *See*—
Putsch, Peter-Ulrich; and Cremer, Heinz P., 4,679,854, Cl. 297-486.000.

Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., to Dedicated Technologies, Inc. Trailer creep alarm. 4,680,571, Cl. 340-52.00R.

Kelch, Robert H., to Dow Chemical Company, The. Weatherable coextruded flexible films and laminated structure. 4,680,234, Cl. 428-461.000.

Keldmann, Erick C. V., to Elpan, Aps. Ceiling or wall unit. 4,679,617, Cl. 165-56.000.

Kelemen, Jozsef: *See*—
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.

Keller, Jakob: *See*—
Heliat, Jaan; and Keller, Jakob, 4,679,393, Cl. 60-39.450.

Kelley Company Inc.: *See*—
Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., 4,679,364, Cl. 52-173.0DS.

Kelln, Norman G., to Fisher Scientific Company. Centrifugal analyzer. 4,680,164, Cl. 422-72.000.

Kelly, John A.: *See*—
Young, Paul R.; Koutek, Mary E.; and Kelly, John A., 4,680,124, Cl. 210-697.000.

Kelm, James S.; Maclin, Harvey M.; Vickers, Edward C.; and Wakeman, Thomas G., to General Electric Company. Variable turbine vane support. 4,679,400, Cl. 60-722.000.

Kemeny, George A., to Westinghouse Electric Corp. Electromagnetic launcher rail temperature reduction through controlled breech current injection. 4,679,484, Cl. 89-8.000.

Kemper, Dennis C.: *See*—
Newberry, Mark A.; and Kemper, Dennis C., 4,679,599, Cl. 138-104.000.

Kennedy, Gregory C., to Harbor Branch Oceanographic Institute Inc. Electric motor reversing control devices. 4,680,513, Cl. 318-285.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A. Toy vehicle having simulated engine noise. 4,680,020, Cl. 446-414.000.

Kenner Parker Toys Inc.: *See*—
Baerenwald, Philip M.; and Reed, Phillip G., 4,680,019, Cl. 446-378.000.

Kenney, Michael T.; and Rhoades, Jeffrey S. Colored floor finish. 4,680,237, Cl. 428-520.000.

Kensey, Kenneth; and Nash, John, to Intravascular Surgical Instruments, Inc. Catheter based surgical methods and apparatus therefor. 4,679,558, Cl. 128-328.000.

Kenyon, Ronald W.; and Thorp, Derek, to Imperial Chemical Industries Plc. 2.6-dioxo-2.6-dehydrobenzo[1:2-b,4:5-b]difurans. 4,680,417, Cl. 549-299.000.

Kerby, Walter L.: *See*—
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.

Kerkman, Russel J.; and Rowan, Timothy M., to Allen-Bradley Company. Cross coupled current regulator. 4,680,695, Cl. 363-160.000.

Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Apovincaminol derivative. 4,680,397, Cl. 546-51.000.

Kevex Corporation: *See*—
Bryson, Charles E., III; and Jones, Douglas L., 4,680,467, Cl. 250-305.000.

Key Pharmaceuticals, Inc.: *See*—
Sackner, Marvin A., 4,679,555, Cl. 128-203.150.

Khan, Anwar U.: *See*—
Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., 4,680,762, Cl. 371-28.000.

Khurana, Neeraj, to Intel Corporation. Emission microscope. 4,680,635, Cl. 358-211.000.

Kicherer, Robert: *See*—
Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.

Kido, Tomoyuki: *See*—
Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.

Kiech, Earl L.: *See*—
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.

Kiefer, Silvan, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Instrument for measuring the cohesion force in dental cone crowns. 4,679,444, Cl. 73-827.000.

Kielminski, William P. Pipe coupling connection sealing apparatus. 4,679,831, Cl. 285-332.200.

Kikuchi, Koji: *See*—
Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, 4,679,414, Cl. 68-12.00R.

Kikuchi, Sadatake: *See*—
Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.

Kilroy, Stanley A. R., to Alpen Dairy Foods Pty. Limited. Process of preparing food products. 4,680,194, Cl. 426-602.000.

Kim, Ho K.; and Choi, Seung E. Beverage container with enclosed cooling means. 4,679,407, Cl. 62-294.000.

Kim Hotstart Mfg. Co., Inc.: *See*—
Stein, John, 4,679,597, Cl. 138-26.000.

Kim, Kyo S., to Gold Star Co., Ltd. Reel brake device of a videocassette recorder. 4,679,745, Cl. 242-75.400.

Kimball, James F. Powered step assembly for vehicles. 4,679,810, Cl. 280-166.000.

Kimberly-Clark Corporation: *See*—
Thorson, Russell E.; and Marver, Douglas J., 4,680,450, Cl. 219-388.000.

Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, to Victor Company of Japan. Magnetic recording medium. 4,680,218, Cl. 428-195.000.

Kimura, Hiroyuki: *See*—
Sugai, Yoshiro; and Kimura, Hiroyuki, 4,680,793, Cl. 381-13.000.

Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, to NEC Corporation. Intermediate frequency amplifier with signal strength detection circuit. 4,680,553, Cl. 330-2.000.

Kimura, Tomoaki: *See*—
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, to Institut for Energetik - Zentralstelle fur Rationelle Energieanwendung. Process for manufacturing highly porous mineralic bodies of polymorphic structure. 4,680,153, Cl. 264-44.000.

Kindt-Larsen, Ture: *See*—
Larsen, Hans O.; and Kindt-Larsen, Ture, 4,680,336, Cl. 524-548.000.

King, Donald J.; and Lederman, Frederick E., to General Motors Corporation. Overrunning clutch cage with simplified manufacture. 4,679,676, Cl. 192-45.000.

King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., to Cornell Research Foundation, Inc. Electronic keyboard system and method for reproducing selected symbolic language characters. 4,679,951, Cl. 400-110.000.

King, Roger L.: *See*—
Finfinger, Gerald L.; King, Roger L.; and Marshall, Thomas E., 4,679,435, Cl. 73-594.000.

King, William A.: *See*—
May, William E.; McColloch, Rex, Jr.; and King, William A., 4,680,672, Cl. 361-353.000.

King, William H., to Bourns, Inc. Multi-wire contact assembly. 4,679,886, Cl. 439-816.000.

Kino, Eiko: *See*—
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.

Kinoshita, Kimiaki: *See*—
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Kinoshita, Tosuke: *See*—
Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.

Kinsley, Ann M.; and Mansi, William A., to Wickes Manufacturing Company. Anchoring system. 4,679,369, Cl. 52-155.000.

Kintek, Inc.: *See*—
Blackmer, David E.; and Townsend, James H., Jr., 4,680,796, Cl. 381-23.000.

Kinugawa Rubber Ind. Co. Ltd.: *See*—
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.

Kiraly, Arpad: *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Kirk, Bryan R., to Gillette Company, The. Safety razor blades. 4,679,324, Cl. 30-346.580.

Kirsten, Rolf: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.

Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, to Fanuc Ltd. Method of controlling comb-cutter lathe. 4,680,719, Cl. 364-474.000.

Kiss, Bela: *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Kissinger, Paula A.: *See*—
Assini, John E.; and Kissinger, Paula A., 4,679,883, Cl. 439-607.000.

Kitagawa, Hironobu: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.

Kitamura, Hironori; and Noma, Kanji, to Nippon Foil Manufacturing Co., Ltd. Composite aluminum sheet for presensitized lithographic printing plate comprising a support having specified center line average roughness. 4,680,250, Cl. 430-302.000.

Kitamura, Hironori: *See*—
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.
Kitamura, Yoshinori: *See*—
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.
Kiya, Nobuyuki; and Yoshino, Motoaki, to Fanuc Ltd. Numerical control system. 4,680,697, Cl. 364-171.000.
Kiyohara, Akio: *See*—
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Antitumor agent comprising FR-900216. 4,680,178, Cl. 424-122.000.
Kizilbash, Akeel H. Computer composition of nastaliq script of the urdu group of languages. 4,680,710, Cl. 364-419.000.
Klee, Jurgen: *See*—
Veit, Ernst-Ludwig; and Klee, Jurgen, 4,679,723, Cl. 228-168.000.
Kleeb, Thomas R., to Dresser Industries, Inc. Abrasion resistant refractory composition. 4,680,279, Cl. 501-124.000.
Klein, Karl-Heinz; and Richter, Wilfried, to Robert Bosch GmbH. Method and circuit for suppression of quantitizing noise ambiguities. 4,680,774, Cl. 375-26.000.
Kleinlein, Dwight R.: *See*—
Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., 4,679,844, Cl. 296-136.000.
Kleinnibbelink, Gerrit J.: *See*—
Lutgendorf, Pieter H.; and Kleinnibbelink, Gerrit J., 4,680,463, Cl. 250-223.00B.
Klemp, Eldon J., to Litton Systems, Inc. Fused electrical plug. 4,679,884, Cl. 439-106.000.
Klie, Juergen; and Weiss, Hans-Wilhelm, to G. Duesterloh GmbH. Pneumatic starter. 4,679,533, Cl. 123-179.00F.
Klingel, Reinhard: *See*—
Ginter, Herbert; Klingel, Reinhard; and Manner, Reinhard, 4,680,043, Cl. 65-2.000.
Klockner-Becorit GmbH: *See*—
Lubojatsky, Walter; Lachner, Hans; and Seebacher, Gerald, 4,679,856, Cl. 299-11.000.
Klockner Wilhelmsburger GmbH: *See*—
Flindt, Werner; and Noll, Hans, 4,679,722, Cl. 228-168.000.
Klos, Terry J.: *See*—
Heile, Bernard J.; and Klos, Terry J., 4,680,134, Cl. 252-160.000.
Kloster, Kenneth D. Spring compressor with latchable locking device. 4,679,780, Cl. 267-177.000.
Klugar, Karl; and Van Santvoort, Gerardus P. T. M., to Akzo nv. Railway track structure and a method of building such structure and bags filled with ballast material. 4,679,731, Cl. 238-2.000.
Klupfel, Norbert: *See*—
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.
Kluth, Joachim: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Kluttermann, Jurgen, to Trutzschler GmbH & Co. KG. Sliver coiler. 4,679,279, Cl. 19-159.00R.
Knackstedt, Jack S.: *See*—
Carternock, Frederick A.; and Knackstedt, Jack S., 4,679,337, Cl. 37-118.00R.
Knight, George W.: *See*—
Dohrer, Gregory L.; and Knight, George W., 4,680,328, Cl. 524-137.000.
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, to Babcock & Wilcox Company, The. On-line replacement sensor assembly for a vortex shedding flowmeter. 4,679,445, Cl. 73-861.240.
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., to Tactile Perceptions, Inc. Semiconductor transducer. 4,680,606, Cl. 357-26.000.
Kobari, Katsuo; and Ishida, Hiroshi, to Fanuc Ltd. Induction motor driving system. 4,680,525, Cl. 318-798.000.
Kobayashi, Hiroshi, to Kabushiki Kaisha Sankodo. Band clamping device for luggage transportation. 4,679,671, Cl. 190-115.000.
Kobayashi, Izumi: *See*—
Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, 4,680,054, Cl. 71-93.000.
Kobayashi, Koichi, to Kabushiki Kaisha Toshiba. Recorded disk playback apparatus. 4,680,748, Cl. 369-77.100.
Kobayashi, Masashi: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
Kobayashi, Mikio, to Ricoh Company, Ltd. Input/output port including auxiliary low-power transistors. 4,680,487, Cl. 307-475.000.
Kobayashi, Mitsuo: *See*—
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.
Kobayashi, Ryuichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha. Continuous production of elastic polyesters. 4,680,345, Cl. 525-437.000.
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, to Fujikura Ltd.; and Nippon Telegraph & Telephone Public Corporation. Optical fiber. 4,679,899, Cl. 350-96.300.
Koch, George A.: *See*—
Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.
Koch Industries, Inc.: *See*—
Komin, Andrew P., 4,680,056, Cl. 106-21.000.
Koch, Jurgen: *See*—
Schmitz, Walter; and Koch, Jurgen, 4,680,074, Cl. 156-291.000.
Kodama, Kazuo; and Morikawa, Keishi, to Kabushiki Kaisha Komatsu Seisakusho. Crankshaft milling machine. 4,679,973, Cl. 409-200.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Bolza-Schunemann, Claus A., 4,680,806, Cl. 382-65.000.
Kogure, Kazuo: *See*—
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.
Kohen, Isak, to Societe a Responsabilite Limitee l'Electricfil Industrie. Pickup having encapsulated electrical and magnetic elements. 4,680,543, Cl. 324-208.000.
Kohl, Lambert: *See*—
Manzke, Klaus; Schneider, Richard; and Kohl, Lambert, 4,680,656, Cl. 360-98.000.
Kohro, Chihaya: *See*—
Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami, 4,679,861, Cl. 301-37.00P.
Kohsaka, Masanobu: *See*—
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
Koike, Mitsuhiro; and Yakoh, Nobuaki, to Mitsubishi Denki Kabushiki Kaisha. Method of detecting flaws in thick wall steel pipe with ultrasonic angle beam technique. 4,679,437, Cl. 73-622.000.
Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, to Honda Giken Kogyo Kabushiki Kaisha. Wheel assembly for vehicle. 4,679,860, Cl. 301-9.0DN.
Koitabashi, Takeo: *See*—
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.
Kojima, Atsushi: *See*—
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.
Kok, Frans J. J. A., to Dresser Europe S.A. Tube coupling. 4,679,830, Cl. 285-323.000.
Kolawole, Joshua O.: *See*—
Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.
Kolbenschmidt AG: *See*—
Creydt, Martin; Bickle, Wolfgang; and Pfestorf, Harald, 4,679,681, Cl. 192-107.00M.
Kolbesen, Bernd: *See*—
Mitlehner, Heinz; and Kolbesen, Bernd, 4,680,601, Cl. 357-15.000.
Kolbus GmbH & Co. KG: *See*—
Blidschun, Benno; and Lierke, Ernst G., 4,680,163, Cl. 422-28.000.
Koleske, Joseph V.; Smith, Donald F.; and Weber, Robert J., to Union Carbide Corporation. Novel polymers and crosslinked compositions made therefrom. 4,680,361, Cl. 526-318.000.
Kollmorgen Technologies Corporation: *See*—
Plonski, J. Philip, 4,679,321, Cl. 29-850.000.
Schultz, Roy D.; England, Thomas R.; and Altizor, C. Clark, 4,679,313, Cl. 29-596.000.
Komatsu, Akira: *See*—
Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, 4,680,720, Cl. 364-521.000.
Komatsu, Toshiyuki: *See*—
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.
Komatz, Dennis J., to Lucas Industries Public Limited Company. Clutch master cylinder with internal reservoir. 4,679,680, Cl. 192-85.00R.
Komeya, Katsutoshi: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,680,278, Cl. 501-98.000.
Komin, Andrew P., to Koch Industries, Inc. Carbonless paper solvent utilizing triisopropyltoluene. 4,680,056, Cl. 106-21.000.
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling generator for vehicle. 4,680,529, Cl. 322-28.000.
Komuro, Katsusuke, to Honda Giken Kogyo Kabushiki Kaisha. Rear seat cover for vehicles having a saddle-shaped seat. 4,679,647, Cl. 180-219.000.
Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Apparatus for fuse-bonding articles. 4,679,721, Cl. 228-40.000.
Kondoh, Hiroshi: *See*—
Dalman, G. Conrad; and Kondoh, Hiroshi, 4,680,538, Cl. 324-58.00R.
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., to TeleMeter Corporation. Optical sensor apparatus and method for remotely monitoring a utility meter or the like. 4,680,704, Cl. 364-525.000.

Konig, Klaus: *See—*
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,679,929, Cl. 355-4.000.
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,680,625, Cl. 358-80.000.
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.

Koo, Gloria C.: *See—*
Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, 4,680,258, Cl. 435-7.000.

Koontz, Harry S., to PPG Industries, Inc. Apparatus and method for determining contour characteristics of a contoured article. 4,679,331, Cl. 33-551.000.

Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the production of urea group-containing polyisocyanates. 4,680,367, Cl. 528-44.000.

Koppers Company, Inc.: *See—*
Demers, Harlan, 4,679,658, Cl. 182-221.000.
Mess, Richard C., 4,679,362, Cl. 52-125.500.

Korsunsky, Iosif: *See—*
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,679,319, Cl. 29-843.000.

Kosaka, Michitaka: *See—*
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.

Kosarski, Raymond, Jr.; and Jackson, Robert W., to Allied Corporation. Hydraulic power brake apparatus. 4,679,397, Cl. 60-562.000.

Koseki, Ryoji, to Amada Engineering Service Co., Inc. Mirror adjustment device in laser oscillator. 4,680,771, Cl. 372-107.000.

Koster, William H.: *See—*
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,680,388, Cl. 540-203.000.

Kostrov, Sergei V.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Kot, Norbert J., II: *See—*
Horn, Edward R.; and Kot, Norbert J., II, 4,679,782, Cl. 269-228.000.

Koutek, Mary E.: *See—*
Young, Paul R.; Koutek, Mary E.; and Kelly, John A., 4,680,124, Cl. 210-697.000.

Kowalski, Carl R.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.

Koyama, Yasuo: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Koyamato, Hisakazu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic drum. 4,679,479, Cl. 84-1.040.

Koziol, Walter, to Modern Home Products Corp. Threaded adjustable gas intake assembly. 4,679,544, Cl. 126-41.00R.

Kozlik, Tony J.; and Landini, Bruce J., to Honeywell Inc. Local area network special function frames. 4,680,581, Cl. 340-825.060.

Kozlov, Jury I.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Krafcik, Joseph T.; Barnes, Richard J.; and Goetter, Erwin H., to Preformed Line Products Company. Optical fiber splice organizer. 4,679,896, Cl. 350-96.200.

Kraft, Eugene. Varying firmness mattress. 4,679,266, Cl. 5-464.000.

Krahenbuhl, Roland. Fasteners for chains, necklaces, bangles, and similar pieces of jewelry. 4,679,280, Cl. 24-233.000.

Krall, Thomas J.: *See—*
Plenzler, John A.; Krall, Thomas J.; and Nowicki, Casimir W., 4,679,997, Cl. 425-126.00R.

Kramer, Francis J., to Senco Products, Inc. Electronic control for a pneumatic fastener driving tool. 4,679,719, Cl. 227-5.000.

Kramer, James H., to B. F. Goodrich Company, The. Fender protective structures. 4,679,517, Cl. 114-45.000.

Kramer, Kenneth D.; and Olson, Rohn L., to Deere & Company. Low leakage orifice-controlled poppet valve. 4,679,765, Cl. 251-38.000.

Krans, Peter; and Meuleman, Hermanus J., to Remeha Fabrieken B.V. Heating boiler having a vertical burner tube. 4,679,528, Cl. 122-367.00C.

Kranz, Joachim, to BASF Aktiengesellschaft. Preparation of polyhalocopper phthalocyanines having a high color strength. 4,680,387, Cl. 540-136.000.

Krause, Norbert, to Siemens Aktiengesellschaft. High-frequency antenna device in apparatus for nuclear spin tomography and method for operating this device. 4,680,550, Cl. 324-318.000.

Krinock, Jerome V., to Motorola, Inc. Fast acquisition circuit for synchronous digital receiver operating in wideband noise. 4,680,778, Cl. 375-97.000.

Kristinsson, Haukur; and Topfl, Werner, to Ciba-Geigy Corporation. Sulfonylisoureas. 4,680,395, Cl. 544-321.000.

Kriz, Helmut; and Stadler, Hansjorg, to Diehl GmbH & Co. Deformable mirror. 4,679,915, Cl. 350-611.000.

Kriz, Thomas A., to International Business Machines Corp. Data processing system with reorganization of disk storage for improved paging. 4,680,703, Cl. 364-200.000.

Krol, Denise M.: *See—*
Spierings, Gijsbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., 4,680,503, Cl. 313-480.000.

Krug, Martin: *See—*
Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., 4,679,616, Cl. 165-43.000.

Kruger, Robert J.; and Brown, Richard I., to Baxter Travenol Laboratories, Inc. Blood component collection systems and methods. 4,680,025, Cl. 604-6.000.

Krull, Nicholas J.: *See—*
Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., 4,680,524, Cl. 318-696.000.

Krupp, Gerald L. Logic circuit tester. 4,680,542, Cl. 324-133.000.

Krutz, Gary; and Hansen, David L. Integral rotational displacement sensor for an hydraulic motor. 4,679,488, Cl. 91-1.000.

Kubler, Erwin: *See—*
Veyhl, Wolf; and Kubler, Erwin, 4,679,510, Cl. 108-152.000.

Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system with operation control for a pressure reduction fluid pump in hydraulic brake circuit. 4,680,713, Cl. 364-426.000.

Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system with reduced duration of wheel acceleration and deceleration calculation. 4,680,714, Cl. 364-426.000.

Kubota, Yousuke, to Kabushiki Kaisha Toshiba. Electromagnetic flow meter. 4,679,442, Cl. 73-861.120.

Kubota, Yuzuru: *See—*
Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.

Kuhlman, Thomas E. Welder's mask with remote controlled eye shield. 4,679,255, Cl. 2-8.000.

Kuhnel, Werner; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Molding composition for crosslinked foam material from polyolefins and ethylene-propylene elastomer, and process for the production of the foam material. 4,680,317, Cl. 521-89.000.

Kukes, Simon G.: *See—*
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,680,105, Cl. 208-251.00H.

Kulczycki, Elaine S.: *See—*
Habel, Paul A., Jr.; and Kulczycki, Elaine S., 4,679,678, Cl. 192-106.200.

Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, to Fujitsu Limited. Switching system having tone trunk. 4,680,758, Cl. 370-110.200.

Kumazawa, Koichi: *See—*
Kuroda, Toshio; and Kumazawa, Koichi, 4,680,618, Cl. 357-74.000.

Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, to Nissan Motor Co., Ltd. Line pressure control device for hydraulic control system of automatic transmission. 4,679,466, Cl. 74-863.000.

Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical. Monoclonal antibody to human T cells. 4,680,383, Cl. 530-387.000.

Kunkle, Albert C.; and Maxwell, Edgar J., III, to J. M. Huber Corporation. Apparatus for dewatering clay filter cake. 4,680,104, Cl. 204-300.00R.

Kuo, Calven, to Aurora Mechatronecs Corp. Method of manipulating a calculation and device used therewith. 4,680,455, Cl. 235-146.000.

Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, to Fanuc Ltd. Servomotor velocity control method. 4,680,518, Cl. 318-561.000.

Kuramoto, Masahiko: *See—*
Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, 4,680,353, Cl. 526-160.000.

Kurihara, Kazuaki: *See—*
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.

Kurihara, Toshihiko, to Pioneer Electronic Corporation. Lens driving device for an optical pickup unit with simplified construction. 4,679,904, Cl. 350-255.000.

Kuroda, Toshio; and Kumazawa, Koichi, to Narumi China Corporation. Package comprising a composite metal body brought into contact with a ceramic member. 4,680,618, Cl. 357-74.000.

Kuroda, Yasuo: *See—*
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Kurz, Heinrich: *See—*
Dammann, Hans; and Kurz, Heinrich, 4,679,901, Cl. 350-162.200.

Kusaka, Hideo: *See—*
Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, 4,680,639, Cl. 358-224.000.

Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, to Yokogawa Hokushin Electric Corporation. Displacement transducer which simultaneously extracts signals via sequential switching. 4,680,466, Cl. 250-231.0SE.

Kuwajima, Takeshi: *See—*
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12.000.

Kuwana, Kazutaka: *See—*
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.

Kuze, Yoshikazu. Cooling system for an automobile engine. 4,679,530, Cl. 123-41.100.

Kuznetsov, Vladimir P.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, to Hitachi, Ltd. Method for designating a recognition mode in a hand-written character/graphic recognizer. 4,680,804, Cl. 382-13.000.

Kyocera Corporation: *See—*
Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,680,742, Cl. 369-13.000.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.

L. M. Becker & Co., Inc.: *See—*
Glaser, Robert L., 4,679,684, Cl. 194-350.000.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,680,302, Cl. 514-327.000.

Laby, Jordan M.: *See—*
Henkin, Melvyn L.; and Laby, Jordan M., 4,679,258, Cl. 4-542.000.

Lachner, Hans: *See—*
Lubojatsky, Walter; Lachner, Hans; and Seebacher, Gerald, 4,679,856, Cl. 299-11.000.

LaCoste, Bernard L.: *See—*
Dawawala, Suryakant K.; and LaCoste, Bernard L., 4,679,769, Cl. 251-282.000.

Lact-Assist, Incorporated: *See—*
Stuart, Herbert H., 4,680,028, Cl. 604-74.000.

Ladouceur, Harold A.: *See—*
Steward, John H.; and Ladouceur, Harold A., 4,679,690, Cl. 206-345.000.

Lafon, Louis, to Laboratoire L. Lafon. 1-alkyl-3-hydroxy-3-phenylpiperidines. 4,680,302, Cl. 514-327.000.

La Grange, Nyle D.; Nielsen, Darryl M.; and Harbison, Joe A., to Marley-Wylain Company, The. Adjustable float assembly for pumps. 4,680,437, Cl. 200-84.00R.

LaGrange, Nyle D.: *See—*
Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., 4,679,991, Cl. 417-360.000.

Lahr, Helfrid; and Pontani, Bernd, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Storage container assembly for accommodating individual fuel rods of irradiated nuclear reactor fuel elements. 4,680,159, Cl. 376-272.000.

Laird, James A.: *See—*
Gibb, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,680,230, Cl. 428-403.000.

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Lapeyre, James M., 4,680,725, Cl. 364-709.000.

Lakhani, Amir A.; and Olver, Laurence C., to Allied Corporation. Method of fabricating self-aligned field-effect transistor having t-shaped gate electrode, sub-micron gate length and variable drain to gate spacing. 4,679,311, Cl. 29-579.000.

Lamb, C. Paul, to Teledyne Industries, Inc. Valve seat design to reduce cavitation. 4,679,592, Cl. 137-625.330.

Lambrecht, Emiel, to FMC Corporation. Cutting thermoplastic webs. 4,679,474, Cl. 83-171.000.

Lamont, Lawrence T., Jr., to Varian Associates, Inc. Method of thermal treatment of a wafer in an evacuated environment. 4,680,061, Cl. 148-1.500.

Landaas, Viggo. Combination gun with repeater mechanism. 4,679,486, Cl. 89-126.000.

Landecker, Peter B., to Hughes Aircraft Company. Surveying satellite incorporating star-sensing attitude determination subsystem. 4,679,753, Cl. 244-171.000.

Landini, Bruce J.: *See—*
Kozlik, Tony J.; and Landini, Bruce J., 4,680,581, Cl. 340-825.060.

Landry, Richard E.; and Reed, Joel G., to GTE Products Corporation. Triple pass ceramic cross-flow heat recuperator. 4,679,623, Cl. 165-166.000.

Lang, Paul W.; and Gribshaw, Franklin C., to Jensen, C. Allen. Cigarette. 4,679,574, Cl. 131-365.000.

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Langenbach, John F.: *See—*
Langenbach, George; and Langenbach, John F., 4,679,353, Cl. 49-257.000.

Langstaff, Scott A.: *See—*
Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., 4,680,475, Cl. 250-577.000.

Lannuzel, Olivier, to CGR Ultrasonic. Process for removing all ambiguity from the measurement by Doppler effect of the speed of a moving target. 4,680,739, Cl. 367-90.000.

Lapeyre, James M., to Laitram Corporation, The. Dual function decimal key. 4,680,725, Cl. 364-709.000.

Larsen, Hans O.; and Kindt-Larsen, Ture, to Vistakon, Inc. Method of forming shaped hydrogel articles. 4,680,336, Cl. 524-548.000.

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Bauer, Theodore J.; Herke, Donald P.; Bork, Edward A.; and Lawson, William E., 4,680,442, Cl. 219-121.0LG.

Laser Magnetic Storage International Company: *See—*
Smith, Jay A., 4,679,747, Cl. 242-195.000.

Lasertechnics, Inc.: *See—*
Bell, William E.; and Collins, George J., 4,680,770, Cl. 372-99.000.

LaValley Industrial Plastics, Inc.: *See—*
LaValley, Richard W., 4,680,115, Cl. 210-247.000.

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Law, Joseph P., to Thomas & Betts Corporation. Raintight and oiltight connector for flexible conduit. 4,679,827, Cl. 285-158.000.

Lawrence, Christopher J.: *See—*
Naylor, Geoffrey; and Lawrence, Christopher J., 4,679,284, Cl. 28-272.000.

Lawrence, Craig J.; and Ferriola, John J., to Bethlehem Steel Corp. Fluid conduit coupling for a metallurgical converter trunnion. 4,679,774, Cl. 266-246.000.

Lawrence, Richard R.: *See—*
Malsbury, Charles R.; and Lawrence, Richard R., 4,679,699, Cl. 220-307.000.

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Layton, Marilyn. Needle orgnizer. 4,679,716, Cl. 223-109.00R.

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Regla, Juan; and Lazaro, Jose, 4,679,876, Cl. 439-426.000.

Leavitt, Michael; and Huls, David S., to Hamilton House Marketing, Inc. Cheese product and method of manufacture. 4,680,181, Cl. 426-36.000.

Lech, Thaddeus, Jr.; and Mullard, Bruce A., to Borg-Warner Automotive, Inc. Clutch driven plate assembly with anti-backlash damping. 4,679,679, Cl. 192-106.200.

Lechaczynski, Michel A.: *See—*
Duforestel, Guy G.; Lechaczynski, Michel A.; Poiraud, Clement Y.; and Viallon, Paul P., 4,680,733, Cl. 364-900.000.

Lechtken, Peter: *See—*
Hettche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, 4,680,327, Cl. 524-110.000.

Lederman, Frederick E.: *See—*
King, Donald J.; and Lederman, Frederick E., 4,679,676, Cl. 192-45.000.

Lee, Arnold S. J. Ballistocardiograph. 4,679,569, Cl. 128-714.000.

Lee, Biing-lin, to B. F. Goodrich Company, The. Chlorinated poly(vinyl chloride) thermoplastic alloys. 4,680,343, Cl. 525-148.000.

Lee, George W.: *See—*
Gibb, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,680,230, Cl. 428-403.000.

Lee, Yuan-Ho. Form set-up. 4,679,762, Cl. 249-26.000.

Leeson, Lewis J., to Ciba-Geigy Corporation. Devices and methods for treating memory impairment. 4,680,172, Cl. 424-449.000.

Leff, Kenneth J.: *See—*
Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., 4,679,881, Cl. 439-392.000.

Leff, Thomas E. Container rack. 4,679,695, Cl. 211-71.000.

Lefrancier, Pierre: *See—*
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Lehmann, Peter; and Michel, Manfred, to Hoechst Aktiengesellschaft. Light-sensitive recording material for the production of a printing form or printed circuit with photoconductive layer and light-sensitive overlayer. 4,680,244, Cl. 430-66.000.

Lehnert, Ralf; Tran-Gia, Phuoc; and Lempennau, Wolfram, to U.S. Philips Corporation. Traffic simulator for testing exchanges taking the subscriber-system interaction into account. 4,680,784, Cl. 379-11.000.

Leifheit AG: *See—*
Schufer, Dieter, 4,679,817, Cl. 280-655.000.

Leistner, Herbert E. Nail strip with covered wire attaching means. 4,679,975, Cl. 411-443.000.

Leland, John E.; Dix, James S.; and Wright, Roy F., to Phillips Petroleum Company. Poly(arylene sulfide) composition with improved insulation resistance and cracking resistance. 4,680,326, Cl. 524-106.000.

Leland Stanford Junior University, Board of Trustees of the: *See—*
Galbraith, Douglas C., 4,679,560, Cl. 128-419.00R.

Lempennau, Wolfram: *See—*
Lehnert, Ralf; Tran-Gia, Phuoc; and Lempennau, Wolfram, 4,680,784, Cl. 379-11.000.

Lenhard, Martin: *See—*
Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, 4,680,198, Cl. 427-164.000.

Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., to General Electric Company. Method for making a fluid cooled acyclic generator rotor. 4,679,314, Cl. 29-598.000.

Leorat, Francois; Coutant, Patrick; and Aubert, Paul, to Regie Nationale des Usines Renault. Two-range pressure control system. 4,679,988, Cl. 417-218.000.

LePoire, Robert A. Adjustable jig. 4,679,781, Cl. 269-45.000.

Lerner, Bernard: *See—*
Lerner, Hershey; and Lerner, Bernard, 4,680,205, Cl. 428-29.000.
Lerner, Hershey; and Lerner, Bernard, to Automated Packaging Systems, Inc. Continuous web registration. 4,680,205, Cl. 428-29.000.
Leroux, Gerald E.: *See—*
Waltman, John H.; Stewart, Wesley J.; and Leroux, Gerald E., 4,679,543, Cl. 126-25.00R.
Lessard, Philip A.; Bartlett, Allen J.; and Peterson, John F., to Helix Technology Corporation. Temperature control of cryogenic systems. 4,679,401, Cl. 62-55.500.
Lester, James N.: *See—*
Fallier, Charles N., Jr.; and Lester, James N., 4,680,509, Cl. 315-290.000.
Letournel, Michel; Helleboid, Jean-Marie; and Teissier, Claude, to Centre National de la Recherche Scintifique. Apparatus for conveying electrostatic charges, in particular for very high voltage electrostatic generators. 4,680,496, Cl. 310-308.000.
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., to General Electric Company. Gradient field switch for improved magnetic resonance imaging/spectroscopy system. 4,680,547, Cl. 324-309.000.
Leussler, Wilhelm, to Metallgesellschaft Aktiengesellschaft. Method of automatically controlling an electrostatic precipitator. 4,680,036, Cl. 55-2.000.
Leuthen, John M., to Hughes Tool Company. Overcurrent protection circuit for power transistors. 4,680,664, Cl. 361-91.000.
Lever Brothers Company: *See—*
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,680,132, Cl. 252-108.000.
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,680,143, Cl. 252-553.000.
Levitt, George; and Zimmerman, William T., to E.I. Du Pont de Nemours and Company. Herbicidal alkenyl sulfonamides. 4,680,053, Cl. 71-93.000.
Lew, Hyok S.; Lew, Hyon S.; and Lew, Yon K. Sky-ride vertical mobility device. 4,679,656, Cl. 182-42.000.
Lew, Hyok S. Direct heat recycling regenerative still. 4,680,090, Cl. 202-187.000.
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Lew, Yon K.: *See—*
Lew, Hyok S.; Lew, Hyon S.; and Lew, Yon K., 4,679,656, Cl. 182-42.000.
Lewis, Gary C.: *See—*
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Leyland Vehicles Limited: *See—*
Greenwood, Christopher J., 4,679,646, Cl. 180-165.000.
Libbey-Owens-Ford Co.: *See—*
Curtze, Edward W., 4,679,525, Cl. 118-500.000.
Liberman, Richard, to Crane Canada Inc. Gate valve for two way flow. 4,679,770, Cl. 251-328.000.
Licentia Patent-Verwaltungs-GmbH: *See—*
Schmitz, Walter; and Koch, Jurgen, 4,680,074, Cl. 156-291.000.
Lidman, Leonida L. M. Coconut fruit(s) flavored brandy. 4,680,179, Cl. 426-15.000.
Liebl, Norbert: *See—*
Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, 4,679,503, Cl. 102-208.000.
Liebler, Ralf; and Albrecht, Klaus, to Rohm GmbH. Molding compositions for optically readable information-storage media. 4,680,359, Cl. 526-309.000.
Lierke, Ernst G.: *See—*
Blidschun, Benno; and Lierke, Ernst G., 4,680,163, Cl. 422-28.000.
Light and Sound Specialties, Inc.: *See—*
Altman, Peter, 4,680,685, Cl. 362-240.000.
Lim, Nam W.: *See—*
Cook, David J.; and Lim, Nam W., 4,680,059, Cl. 106-120.000.
Lin, Ju-Chui; and Abbey, Kirk J., to Glidden Company, The. Low molecular weight polymers and copolymers. 4,680,354, Cl. 526-172.000.
Lind, Robert J.: *See—*
Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.
Linick, James: *See—*
Blomqvist, Ake; and Linick, James, 4,679,748, Cl. 244-3.190.
Linville, James C. Laminated cloth construction. 4,679,519, Cl. 114-103.000.
Lion Brush Works Limited: *See—*
Davey, Brian, 4,679,692, Cl. 206-581.000.
Lipinski, Christopher A., to Pfizer Inc. Sprio-imidazolones for treatment of diabetes complications. 4,680,306, Cl. 514-389.000.
Lipp, Charles W., to Dow Chemical Company, The. Two-fluid nozzle for atomizing a liquid-solid slurry. 4,679,733, Cl. 239-432.000.
Lipper, Robert A.: *See—*
Kaplan, Murray A.; Bogardus, Joseph B.; and Lipper, Robert A., 4,680,389, Cl. 540-222.000.
Litton Systems, Inc.: *See—*
Klemp, Eldon J., 4,679,884, Cl. 439-106.000.
Millman, Ronald W., 4,680,439, Cl. 219-10.55R.
Pavlath, George A., 4,679,894, Cl. 350-96.150.
Stewart, Robert E., 4,679,434, Cl. 73-517.00B.
Livne, Avinoam, to Advanced Products Ltd. Method and apparatus for heating and/or cooling objects simultaneously at different preselected temperatures. 4,679,615, Cl. 165-1.000.
Locker, Howard W. Air diffuser. 4,679,495, Cl. 98-40.120.
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Peterson, Paul F., 4,679,751, Cl. 244-137.400.
Lockheed Missiles & Space Company, Inc.: *See—*
Stewart, James P., 4,679,961, Cl. 403-341.000.
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, to Bayer Aktiengesellschaft. N-glycosylated carboxamide derivatives as growth-promoters in livestock feeding. 4,680,287, Cl. 514-42.000.
Locotos, Frank M.: *See—*
Hipkins, Edward C., Sr.; and Locotos, Frank M., 4,679,967, Cl. 405-288.000.
Logan, David J., to Metromedia Company. Method and apparatus for controlling ink-jet color printing heads. 4,680,596, Cl. 346-140.0PD.
Lohneis, Earl R.; and Woythal, Robert T., to Kearney & Trecker Corporation. High speed toolholder for a machining center. 4,679,970, Cl. 408-128.000.
Lohstroh, Jan; and Josquin, Wilhelmus J. M. J., to U.S. Philips Corporation. Semiconductor device having silicon conductor tracks connected by a metal silicide track. 4,680,619, Cl. 357-86.000.
Lok, Kar P.: *See—*
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., 4,680,332, Cl. 524-377.000.
Lomax, Donald P.; and Boggs, Ronald M. Method for making a trimetallic cylinder. 4,679,294, Cl. 29-460.000.
Look, Raymond J.: *See—*
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.
Lopez, Angel, to Jean Greub S.A. Modular machine tool for series machining of parts in a bar. 4,679,295, Cl. 29-564.800.
Lord Corporation: *See—*
Goumas, Peter G.; and Wolfe, Paul T., 4,680,523, Cl. 318-685.000.
Lortz, Allan R.: *See—*
Anthony, James R.; and Lortz, Allan R., 4,679,852, Cl. 297-464.000.
Lothrop, John R.: *See—*
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.
Louie, Chuen W.: *See—*
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.
Loveless, John H., to Johns Hopkins University, The. Chin actuated controller system for controlling powered apparatus. 4,679,644, Cl. 180-6.500.
Lowe, Barrie M.; and Fegan, Stuart G., to Imperial Chemical Industries PLC. Synthesis of zeolitic materials using ion-exchange resin. 4,680,170, Cl. 423-329.000.
Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, to Terrafix Limited. Position finding system. 4,680,590, Cl. 342-457.000.
Lowell, Charles R.: *See—*
Sedrick, A. Victor, Jr.; and Lowell, Charles R., 4,679,720, Cl. 228-20.000.
Lowey, Hans. Method and composition for the preparation of controlled long-acting pharmaceuticals for oral administration. 4,680,323, Cl. 524-43.000.
Loy, Fernand R., to U.S. Philips Corporation. Binocular eyepiece. 4,679,912, Cl. 350-410.000.
Lozon, Richard. Sound enhancing device. 4,679,481, Cl. 84-309.000.
Lozyniak, Roman: *See—*
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.
Lu, Li-Hsing. Descending life-escaping device specially for a high building use. 4,679,654, Cl. 182-5.000.
Lubock, Paul; and Sullivan, Mike, to Shiley Inc. Releasable holder and method of use. 4,679,556, Cl. 128-303.00R.
Lubojatsky, Walter; Lachner, Hans; and Seebacher, Gerald, to Klockner-Becorit GmbH. Mine self-advancing roof support and method of relocating a mine winning face equipped with self-advancing roof support. 4,679,856, Cl. 299-11.000.
Lubrizol Genetics, Inc.: *See—*
Puhler, Alfred; Simon, Reinhard; and Priefer, Ursula, 4,680,264, Cl. 435-172.300.
Lucas, Gary M., to General Electric Company. Room temperature vulcanizable silicone compositions having improved adhesion. 4,680,364, Cl. 528-15.000.
Lucas Industries Public Limited Company: *See—*
Komatz, Dennis J., 4,679,680, Cl. 192-85.00R.
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., to Robertshaw Controls Company. Pneumatic control system, control means therefor and method of making the same. 4,679,583, Cl. 137-84.000.
Lucius, Thomas A.: *See—*
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.
Luckger, Rolf: *See—*
Feller, Otto; Brocksieper, Manfred; and Luckger, Rolf, 4,679,472, Cl. 82-19.000.
Ludwig, Bernd. Method and device for the aligning of an element, e.g. frame, to be inserted into a wall opening. 4,679,373, Cl. 52-745.000.
Luetzelschwab, Wayne E., to Marathon Oil Company. Dilution apparatus and method. 4,679,628, Cl. 166-252.000.
Luksha, Eugene, to Cardiac Pacemakers, Inc. Glucose sensor. 4,679,562, Cl. 128-635.000.
Luly, Jay R.; Plattner, Jacob J.; and Fung, Anthony K., to Abbott Laboratories. Modified phenylalanine peptidylaminodiols. 4,680,284, Cl. 514-18.000.

Lund, Richard A.: *See*—
Maue, Dale N.; and Lund, Richard A., 4,679,591, Cl. 137-624.130.

Lund, Svend, to Akademiet for de Tekniske Videnskaber, Svejsecentralen. System for the internal inspection of pipelines. 4,679,448, Cl. 73-866.500.

Lund, Walter; Berman, Lou; and Dothan, Felix, to Phonocardioscope Partners. Phonocardioscope with a liquid crystal display. 4,679,570, Cl. 128-715.000.

Lundahl, E. Cordell; West, Neil L.; and Witzel, Homer D., to Deere & Company. Harvester for the impact-stripping of seed from a standing crop. 4,679,386, Cl. 56-126.000.

Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, to Nestec S.A. Solubilization of tea in cold water with catechin. 4,680,193, Cl. 426-597.000.

Luo, Chung-I. Quick-release wheelchair axle. 4,679,862, Cl. 301-112.000.

Lutgendorf, Pieter H.; and Kleinnibbelink, Gerrit J., to Hajime Industries Ltd. Apparatus for checking containers. 4,680,463, Cl. 250-223.00B.

Luthi, Walter, to Tesa S.A. Sensor device for a machine for measuring conductive parts mounted on a measurement table. 4,679,332, Cl. 33-559.000.

Lux, Horst; and Schatzler, Walter, to Webasto-Werk W. Baier GmbH & Co.; and Daimler-Benz Aktiengesellschaft. Sliding and lifting roof with tiltable sliding liner panel controlled by a guidance arrangement. 4,679,846, Cl. 296-214.000.

Lynch, Bobby R. Apparatus and method for rimming containers. 4,680,016, Cl. 493-159.000.

Lynch Communication Systems, Inc.: *See*—
Davidow, Clifford A., 4,680,750, Cl. 370-16.000.

Lynch, Eugene F.: *See*—
Straayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., 4,680,577, Cl. 340-711.000.

Maag, Hans: *See*—
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,680,415, Cl. 549-214.000.

MacAdam, Donald H., to Annulus Technical Industries, Inc. Contact assembly for a switch. 4,680,433, Cl. 200-16.00D.

Macaroni, Inc.: *See*—
Maccarone, Anthony J.; and Orr, Stephen M., 4,679,702, Cl. 220-90.200.

Maccarone, Anthony J.; and Orr, Stephen M., to Macaroni, Inc. Sanitary drinking accessory for a metal beverage can. 4,679,702, Cl. 220-90.200.

MacDonald, Ellie H.: *See*—
Bennett, Ronald W.; and MacDonald, Ellie H., 4,679,657, Cl. 182-113.000.

Macelwee, Thomas W.: *See*—
Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., 4,680,609, Cl. 357-42.000.

Machet, Rene H.: *See*—
Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., 4,680,671, Cl. 361-329.000.

Machida, Kazumi: *See*—
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.

Maclin, Harvey M.: *See*—
Kelm, James S.; Maclin, Harvey M.; Vickers, Edward C.; and Wakeman, Thomas G., 4,679,400, Cl. 60-722.000.

Maddox, Edward L.: *See*—
Baker, Richard H.; and Maddox, Edward L., 4,680,490, Cl. 307-575.000.

Madrigal, Anthony: *See*—
Galloway, James J.; and Madrigal, Anthony, 4,679,645, Cl. 180-65.800.

Maeda, Takashi: *See*—
Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,680,742, Cl. 369-13.000.

Maehara, Atsushi: *See*—
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,679,996, Cl. 418-201.000.

Maga, Raymond A.: *See*—
Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., 4,679,885, Cl. 439-620.000.

Magid, David J.; Svitila, Barbara; and Kalriess, William, to Enviro-Spray Systems, Inc. Dispensing system with inflatable bag propelling mechanism and separate product gas phase. 4,679,706, Cl. 222-130.000.

Magyar, Karoly: *See*—
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.

Mahajan, Satish W.: *See*—
Mandal, Arun K.; Jawalkar, Damodar G.; and Mahajan, Satish W., 4,680,418, Cl. 549-305.000.

Mahawili, Imad, to Genus, Inc. Cooled optical window for semiconductor wafer heating. 4,680,447, Cl. 219-343.000.

Maier, Andreas, to Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG. Rotary cutting tool and process for making same. 4,679,971, Cl. 408-145.000.

Mains, Donald M.: *See*—
Jasinski, Richard A.; and Mains, Donald M., 4,679,489, Cl. 91-36.000.

Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, to Societe de Recherches Industrielles (S.O.R.I.). Benzoylphenyl-piperidine derivatives. 4,680,402, Cl. 546-235.000.

Maki, Hirohisa; and Matsuo, Katsuaki, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Protective coating on concrete construction. 4,680,203, Cl. 427-393.600.

Makimura, Osamu: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.

Malek, Edward J.: *See*—
Crapser, James R.; and Malek, Edward J., 4,679,713, Cl. 222-402.130.

Malka, Jacob H.; and Osetec, Marc, to Allied Corporation. Function generator. 4,680,726, Cl. 364-721.000.

Mallinckrodt, Inc.: *See*—
Conner, Donald E., 4,680,144, Cl. 260-501.150.
Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., 4,680,325, Cl. 524-101.000.

Malsbury, Charles R.; and Lawrence, Richard R., to Rexcel, Inc. Sealing lid and container. 4,679,699, Cl. 220-307.000.

Malwitz, Nelson E., to Sealed Air Corporation. Fire-retardant plastics with glycoside additive. 4,680,324, Cl. 524-58.000.

Mancel, Gerard, to Electricite de France Service National. Steam generator feed water heater. 4,679,529, Cl. 122-441.000.

Mandal, Arun K.; Jawalkar, Damodar G.; and Mahajan, Satish W., to IEL Limited. Process for the production of a (1R,Cis)-4 acetyl-6,6-dimethyl-3-oxabicyclo-(3.1.0.)-hex-2-one. 4,680,418, Cl. 549-305.000.

Mandi, Attila: *See*—
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.

Mangeym, Gennady: *See*—
Guzik, Nahum; Mangeym, Gennady; and Jones, James W., 4,680,516, Cl. 318-326.000.

Mankedick, Robert G.: *See*—
Barnes, Lawrence C.; and Mankedick, Robert G., 4,680,622, Cl. 358-22.000.

Manner, Reinhard: *See*—
Ginter, Herbert; Klingel, Reinhard; and Manner, Reinhard, 4,680,043, Cl. 65-2.000.

Mannesmann Rexroth GmbH: *See*—
Kauss, Wolfgang, 4,679,633, Cl. 172-1.000.

Manola, Umberto, to Protein's Technology S.p.A., The. Device for separation of the components of edible meals. 4,680,107, Cl. 209-139.200.

Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, to Synthelabo. Piperidine derivatives and pharmaceutical compositions containing them. 4,680,296, Cl. 514-259.000.

Mansi, William A.: *See*—
Kinsley, Ann M.; and Mansi, William A., 4,679,369, Cl. 52-155.000.

Manville Sales Corporation: *See*—
Wilson, Jerry F., 4,679,725, Cl. 229-40.000.

Manzke, Klaus; Schneider, Richard; and Kohl, Lambert, to BASF Aktiengesellschaft. Plural-disk rotatable disk memory with air circulation system. 4,680,656, Cl. 360-98.000.

Mar-Sal Machine Co., Inc.: *See*—
Picciuto, Salvatore, 4,679,605, Cl. 144-117.00R.

Marathon Oil Company: *See*—
Barree, Robert D., 4,679,421, Cl. 73-38.000.
Gibbons, David L., 4,679,625, Cl. 166-270.000.
Luetzelschwab, Wayne E., 4,679,628, Cl. 166-252.000.

Marchand, Patrick, to Jeumont-Schneider Corporation. Generator capable of producing multiple signals with different frequencies and a transmitter which includes a signal generator of this kind. 4,680,586, Cl. 340-870.260.

Mardesich, Nicholas A.: *See*—
Burger, Norman D., 4,680,173, Cl. 424-47.000.

Markem Corporation: *See*—
Kearney, David A., 4,680,082, Cl. 156-497.000.

Markham, Daniel S. Athletic supporter. 4,679,554, Cl. 128-158.000.

Markland Specialty Engineering Ltd.: *See*—
Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., 4,680,475, Cl. 250-577.000.

Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., to Spectra-Physics, Inc. Self leveling transmitter for laser alignment systems. 4,679,937, Cl. 356-138.000.

Marley-Wylain Company, The: *See*—
Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., 4,679,991, Cl. 417-360.000.
Jarr, Klaus D., 4,679,587, Cl. 137-509.000.
La Grange, Nyle D.; Nielsen, Darryl M.; and Harbison, Joe A., 4,680,437, Cl. 200-84.00R.

Marry, Patrick J., to Motorola, Inc. Portable radiotelephone vehicular converter and remote handset. 4,680,787, Cl. 379-63.000.

Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, to Stein Industrie. Support device for thin-walled tubing. 4,679,755, Cl. 248-74.100.

Marsella, John A., to Air Products and Chamicals, Inc. Process for the selective synthesis of tertiary alkanolamines. 4,680,393, Cl. 544-170.000.

Marsh, Jesse. Document holder. 4,679,955, Cl. 402-4.000.

Marshall, Thomas E.: *See*—
Finfinger, Gerald L.; King, Roger L.; and Marshall, Thomas E., 4,679,435, Cl. 73-594.000.

Marsico, Joseph W., Jr.: *See*—
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,680,293, Cl. 514-243.000.

Martin, Marshall H., to Indicator Controls Corporation. Microprocessor controlled loop detector system. 4,680,717, Cl. 364-436.000.

Martin, Russel A.; and Buhler, Steven A., to Xerox Corporation. High voltage depletion mode transistor with serpentine current path. 4,680,605, Cl. 357-23.110.

Martinez, Jean: *See—*
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangheios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.

Maruyama, Masuo: *See—*
Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, 4,680,662, Cl. 360-133.000.

Marver, Douglas J.: *See—*
Thorson, Russell E.; and Marver, Douglas J., 4,680,450, Cl. 219-388.000.

Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co.: *See—*
Richter, Gunter; and Froschle, Reinhard, 4,679,357, Cl. 51-281.00P.

Masek, Petr: *See—*
Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, 4,679,701, Cl. 220-404.000.

Masera, Ercole: *See—*
Compagnucci, Rossano; and Masera, Ercole, 4,679,746, Cl. 242-77.200.

Mashiko, Tomoyuki: *See—*
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Mashino, Keiichi, to Hitachi, Ltd. Voltage regulator for generator used in automobile. 4,680,530, Cl. 322-33.000.

Maskasky, Joe E., to Eastman Kodak Company. Emulsions and photographic elements containing silver halide grains having hexoctamedral crystal faces. 4,680,254, Cl. 430-567.000.

Maskasky, Joe E., to Eastman Kodak Company. Emulsions and photographic elements containing silver halide grains having tetrahexahedral crystal faces. 4,680,255, Cl. 430-567.000.

Maskasky, Joe E.; and Jones, Ralph W., to Eastman Kodak Company. Emulsions and photographic elements containing silver halide grains having trisoctahedra crystal faces. 4,680,256, Cl. 430-567.000.

Mason, Robert K.: *See—*
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,679,316, Cl. 29-731.000.

Massie, James D.: *See—*
Flores, David P.; Meiller, John G.; and Massie, James D., 4,680,357, Cl. 526-265.000.

Massie, Mark A.; and Rhodes, Christopher C., to Xerox Corporation. Development apparatus. 4,679,928, Cl. 355-3.0DD.

Masuri, Antonio. Apparatus for opening signatures to be supplied to binding machines. 4,679,783, Cl. 270-54.000.

Mather, Larry R.: *See—*
Dispoto, Gary J.; Mather, Larry R.; and Meyer, John D., 4,680,645, Cl. 358-298.000.

Mathevon, Paul: *See—*
Vere, Bernard; and Mathevon, Paul, 4,680,443, Cl. 219-121.0ED.

Matsubara, Saburo; and Yagi, Shinichi, to Nippon Oil Co., Ltd. Method of making ceramic articles. 4,680,154, Cl. 264-63.000.

Matsuda, Hiromichi, to Inoue MTP Kabushiki Kaisha. Method for manufacturing foamed plastics. 4,680,150, Cl. 264-26.000.

Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus including selective stimulating ray reflection preventing means. 4,680,473, Cl. 250-484.100.

Matsui, Takayuki: *See—*
Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.

Matsumi, Takatomo: *See—*
Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, 4,679,414, Cl. 68-12.00R.

Matsumoto, Haruo: *See—*
Yorita, Tadahiro; Matsumoto, Haruo; and Nakatsuji, Itsuo, 4,680,560, Cl. 333-206.000.

Matsumoto, Osamu: *See—*
Ota, Minemasa; Matsumoto, Osamu; and Ohira, Hiroyuki, 4,680,745, Cl. 369-45.000.

Matsumura, Hideaki: *See—*
Inou, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, 4,680,688, Cl. 363-21.000.

Matsumura, Masahiro; Ogasawara, Kenzi; Nakamoto, Atsuhiro; and Sugawa, Yoshihisa, to Matsushita Electric Works, Ltd. Polyimide prepolymer composition from unsaturated bisimide and diamine containing unreacted reactants. 4,680,377, Cl. 528-322.000.

Matsuo, Katsuaki: *See—*
Maki, Hirohisa; and Matsuo, Katsuaki, 4,680,203, Cl. 427-393.600.

Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, to Seiko Epson Kabushiki Kaisha. Method of preparing preforms for optical fibers. 4,680,046, Cl. 65-17.000.

Matsuo, Nobutaka: *See—*
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.

Matsuoka, Hiroki: *See—*
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.
Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, 4,680,662, Cl. 360-133.000.
Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, 4,680,116, Cl. 210-282.000.
Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, 4,679,990, Cl. 417-312.000.
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Matsushita Electric Works, Ltd.: *See—*
Matsumura, Masahiro; Ogasawara, Kenzi; Nakamoto, Atsuhiro; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.

Matsushita, Yoshihiro: *See—*
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,680,390, Cl. 540-228.000.

Matsuura, Masataka: *See—*
Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, 4,679,909, Cl. 350-333.000.

Matsuzaka, Syoji: *See—*
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.

Maue, Dale N.; and Lund, Richard A., to MTS Systems Corporation. Servovalve drive electronics improvements. 4,679,591, Cl. 137-624.130.

Maurer, Gerald L., to National Research Laboratories. Methods and compositions for treating inflammation or arthritis. 4,680,309, Cl. 514-499.000.

Mavilor Systemes S.A.: *See—*
Pluddemann, Gerhard, 4,680,721, Cl. 364-565.000.

Maxim, John. Multi-action toy vehicle. 4,680,021, Cl. 446-457.000.

Maxwell, Edgar J., III: *See—*
Kunkle, Albert C.; and Maxwell, Edgar J., III, 4,680,104, Cl. 204-300.00R.

May, Michael D.: *See—*
Edwards, Jonathan; Waller, David L.; and May, Michael D., 4,680,698, Cl. 364-200.000.

May, William E.; McColloch, Rex, Jr.; and King, William A., to Siemens-Allis. Molded case circuit breaker with front accessible control panel. 4,680,672, Cl. 361-353.000.

Mayer, Thomas L.: *See—*
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.

Mazda Motor Corporation: *See—*
Hitomi, Mitsuo; Hinatase, Fumio; and Yuzuriha, Yasuhiro, 4,679,531, Cl. 123-52.0MB.

McBride, Frank. Footwear heel-lock support strapping system. 4,679,334, Cl. 36-114.000.

McCarthy, Daniel M., to Honeywell Information Systems Inc. Merge control apparatus for a store into cache of a data processing system. 4,680,702, Cl. 364-200.000.

McCarthy, James M.: *See—*
Newsom, Steven S.; and McCarthy, James M., 4,680,584, Cl. 340-850.000.

McClure, Thomas V.: *See—*
Zybko, Walter C.; Wald, William; and McClure, Thomas V., 4,680,209, Cl. 428-35.000.

McColloch, Rex, Jr.: *See—*
May, William E.; McColloch, Rex, Jr.; and King, William A., 4,680,672, Cl. 361-353.000.

McConnell, Michael P.: *See—*
Davis, James R.; and McConnell, Michael P., 4,679,262, Cl. 5-434.000.

McCoy, Larry J.: *See—*
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.

McCurdy, Frederick A.: *See—*
Douglas, Barry D.; and McCurdy, Frederick A., 4,679,956, Cl. 403-14.000.

McDonie, Arthur F.: *See—*
Helvy, Fred A.; and McDonie, Arthur F., 4,680,504, Cl. 313-524.000.

McDonnell Douglas Corporation: *See—*
Barajas, Felix, 4,680,141, Cl. 252-512.000.
Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., 4,679,298, Cl. 29-571.000.

McEuen, Steven D.: *See—*
Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., 4,680,762, Cl. 371-28.000.

McFay, Dennis J.: *See—*
Brown, Sterling B.; and McFay, Dennis J., 4,680,329, Cl. 524-143.000.

McGill, John C.: *See—*
Vijan, Meera; McGill, John C.; and Day, Paul N., 4,680,085, Cl. 156-643.000.

McGrath, Kenneth J.: *See—*
Schwartz, Paul; Gill, Devinder S.; and McGrath, Kenneth J., 4,680,308, Cl. 514-492.000.

McJohnson, Robert B.: *See—*
Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617.000.

McKechnie, Thomas S.; and Goldenberg, Jill F., to North American Philips Corporation. Bulk diffuser for a projection television screen. 4,679,900, Cl. 350-126.000.

McKendrick, Lorne. Pressure regulator control system. 4,680,441, Cl. 219-91.100.

McLean, Malcolm J.: *See*—
Wauchope, Stirling G.; and McLean, Malcolm J., 4,679,471, Cl. 82-12.000.

McNeal, Norman E.; and Nagy, Richard A., to UNISYS Corporation. Thermoplastic plug method of fabricating an integrated circuit package having bonding pads in a stepped cavity. 4,680,075, Cl. 156-289.000.

Mead, Albert R., to Grumman Aerospace Corporation. Method for securing a panel to a structural member. 4,679,292, Cl. 29-447.000.

Mead Corporation, The: *See*—
Oliff, James R., 4,679,726, Cl. 229-138.000.

Meadows, Roger D.: *See*—
Bryan, James S.; and Meadows, Roger D., 4,679,293, Cl. 29-450.000.

Mears, Larry E. Support clips for supporting electrical fixtures in a junction box. 4,679,882, Cl. 439-569.000.

Mears, William G., to Mobil Oil Corporation. Fuel tank vent valve. 4,679,581, Cl. 137-43.000.

Measurex Corporation: *See*—
Aral, Gurcan; and Balakrishnan, Ramesh, 4,680,089, Cl. 162-198.000.

Meatto, Franklin D.; and Pilpel, Edward D., to TriStar Sports Inc. Randomly oriented reinforcing fibers in a snow ski. 4,679,814, Cl. 280-610.000.

Meckl, Heinz: *See*—
Wernicke, Ubbo; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jurgen, 4,680,123, Cl. 210-683.000.

Megee, Bryan A.; and Whiteside, James D., II, to Phillips Petroleum Company. Method and apparatus for controlling the pressure of gases flowing through a conduit. 4,679,579, Cl. 137-13.000.

Meguire, Patrick G.; and Pitoniak, Thomas J., to NCR Corporation. Chord entry keying of data fields. 4,680,572, Cl. 340-365.00R.

Mehra, Yuv R., to Advanced Extraction Technologies, Inc. Extractive stripping of inert-rich hydrocarbon gases with a preferential physical solvent. 4,680,042, Cl. 62-17.000.

Meier, Johann: *See*—
Dotzler, Josef; and Meier, Johann, 4,679,760, Cl. 248-602.000.

Meiller, John G.: *See*—
Flores, David P.; Meiller, John G.; and Massie, James D., 4,680,357, Cl. 526-265.000.

Meinig, Manfred. Flange ring for pipes. 4,679,832, Cl. 285-414.000.

Meisenburg, Gary L.: *See*—
Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, 4,679,682, Cl. 192-21.000.

Mejia, Ezequiel, to Honeywell Ltd. Information reporting multiplex system. 4,680,582, Cl. 340-825.170.

Melby, Lester R.: *See*—
Janowicz, Andrew H.; and Melby, Lester R., 4,680,352, Cl. 526-147.000.

Melhorn, Nathan: *See*—
Amundson, Anthony P.; and Melhorn, Nathan, 4,680,781, Cl. 375-8.000.

Melocik, Grant C., to Caterpillar Industrial Inc. Fault protection apparatus for traction motor circuit. 4,680,512, Cl. 318-139.000.

Melvin, Lawrence S., Jr.: *See*—
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,680,404, Cl. 546-269.000.

Melvin, Terence; and Nesbitt, R. Dennis, to Spalding & Evenflo Companies, Inc. Optical brighteners in golf ball covers. 4,679,795, Cl. 273-235.00R.

Mendes, Claude, to Giravions Dorand. Process and apparatus for the stabilization of measuring results furnished by an "electron capture" detector with identification of anomalies affecting the detector. 4,680,472, Cl. 250-386.000.

Menon, Govind K.; and Sanders, Winfred J., to SmithKline Beckman Corporation. Feed compositions containing 2-(α-pyridyl)-Δ^2-heterocyclic compounds. 4,680,304, Cl. 514-340.000.

Mercer, Frank B., to P.L.G. Research Limited. Mesh structure and laminate made therewith. 4,680,215, Cl. 428-107.000.

Merck & Co., Inc.: *See*—
Christensen, Burton G.; Salzmann, Thomas N.; and Heck, James V., 4,680,292, Cl. 514-210.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,680,414, Cl. 548-544.000.
Firestone, Raymond A.; and Barker, Peter L., 4,680,391, Cl. 540-355.000.
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,680,392, Cl. 540-527.000.
Veber, Daniel F.; and Freidinger, Roger, 4,680,283, Cl. 514-17.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Irmscher, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, 4,680,288, Cl. 514-63.000.

Mercury Plastics, Inc.: *See*—
Goldman, John G., 4,679,341, Cl. 40-611.000.

Mergenthaler Linotype GmbH: *See*—
Hornig, Klaus-Juergen; and Thiessen, Hans-Henning, 4,680,578, Cl. 340-731.000.

Merten, Gerhard; Rafael, Werner; and Schlusener, Horst, to Gewerkschaft Eisenhutte Westfalia. Hydraulic ram stroke monitoring apparatus. 4,679,429, Cl. 73-168.000.

Mess, Richard C., to Koppers Company, Inc. Void plug lift insert assembly for a cast concrete product. 4,679,362, Cl. 52-125.500.

Mestre, Roland R.: *See*—
Guibert, Alain J. E.; Mestre, Roland R.; and Ritt, Remy P. C., 4,679,981, Cl. 415-116.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.
Fennemann, Wolfgang, 4,680,281, Cl. 502-218.000.
Leussler, Wilhelm, 4,680,036, Cl. 55-2.000.

Metromedia Company: *See*—
Logan, David J., 4,680,596, Cl. 346-140.0PD.

Meuleman, Hermanus J.: *See*—
Krans, Peter; and Meuleman, Hermanus J., 4,679,528, Cl. 122-367.00C.

Meyer, David E.: *See*—
Zeaman, Robert E.; and Meyer, David E., 4,680,454, Cl. 235-95.00R.

Meyer, John D.: *See*—
Dispoto, Gary J.; Mather, Larry R.; and Meyer, John D., 4,680,645, Cl. 358-298.000.

Meyer-Kretschmer, Gustav: *See*—
Hempowitz, Gunter; and Meyer-Kretschmer, Gustav, 4,679,948, Cl. 374-129.000.

Meyers, Lawrence J.: *See*—
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.

Micafil AG: *See*—
Nussbaumer, Manfred; and Fischer, Bruno, 4,679,312, Cl. 29-596.000.

Michel, Manfred: *See*—
Lehmann, Peter; and Michel, Manfred, 4,680,244, Cl. 430-66.000.

Michele, Jurgen, to Grote, Paul. Spiral heat exchanger. 4,679,621, Cl. 165-145.000.

Micro-Mega S.A.: *See*—
Boinot, Jean-Claude, 4,680,011, Cl. 433-29.000.

Microbio Resources, Inc.: *See*—
Nonomura, Arthur M., 4,680,314, Cl. 514-725.000.

Microcom, Inc.: *See*—
Amundson, Anthony P., 4,680,773, Cl. 375-8.000.
Amundson, Anthony P.; and Melhorn, Nathan, 4,680,781, Cl. 375-8.000.

Micronix Corporation: *See*—
Shimkunas, Alexander R.; and Block, Barry, 4,680,243, Cl. 430-5.000.

Micropore International Limited: *See*—
Hughes, John T., 4,680,070, Cl. 156-218.000.

Middleton, Carlisle A. Snow removal system with adjustable snow impeller gate. 4,679,338, Cl. 37-244.000.

Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, to Taisei Road Construction Co., Ltd. Automotive rolling machine. 4,679,962, Cl. 404-126.000.

Mikami, Toshio; and Nagasawa, Yasuo, to Toko, Inc. Battery charging device. 4,680,528, Cl. 320-32.000.

Mikina, Stanley J. Vehicle collision bumper. 4,679,838, Cl. 293-137.000.

Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., to Engineering Measurements Co. Method and apparatus for measuring steam quality. 4,679,947, Cl. 374-42.000.

Miller, David M.: *See*—
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84.000.

Miller, Donald E., to Brazeway, Inc. Method and apparatus for forming intruded branch attachment structures in tubing. 4,679,289, Cl. 29-157.00R.

Miller, Francis M., to Conax Florida Corporation. Method and apparatus for testing a conductivity sensing circuit. 4,680,537, Cl. 324-500.000.

Miller, Gayle W.: *See*—
Szluk, Nicholas J.; and Miller, Gayle W., 4,679,299, Cl. 29-571.000.

Miller, Glenn M.: *See*—
Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., 4,679,364, Cl. 52-173.0DS.

Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., to Sperry Corporation. Standard/proportional multiplexer. 4,680,759, Cl. 370-112.000.

Miller, Paul E.: *See*—
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60.000.

Miller, Richard M. Vehicle cleaning system incorporating novel nozzle apparatus. 4,679,578, Cl. 134-123.000.

Miller, Stewart E., to Bell Communications Research, Inc. Broadband laser amplifier structure. 4,680,769, Cl. 372-50.000.

Miller, Theodore E., Jr.; and Iskandarani, Ziad, to Dow Chemical Company, The. Independent analysis of anions and cations using indirect photometric chromatography. 4,679,428, Cl. 73-61.10C.

Milliken Research Corporation: *See*—
Arnott, Robert C., 4,680,032, Cl. 8-486.000.
Arnott, Robert C., 4,680,034, Cl. 8-481.000.

Millman, Ronald W., to Litton Systems, Inc. Plastic microwave oven cavity. 4,680,439, Cl. 219-10.55R.

Millward, Gareth: *See*—
Bank, Graham; Scaife, Stephen; and Millward, Gareth, 4,680,800, Cl. 381-194.000.

Minagawa, Koji: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.

Minami, Hideaki, to Tsubakimoto Chain Co. Automatic guided vehicle. 4,679,977, Cl. 414-533.000.

Minnesota Mining and Manufacturing Company: *See*—
Elmasry, Mohamed A., 4,680,375, Cl. 528-253.000.
Gibb, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,680,230, Cl. 428-403.000.
John, Gunther, 4,680,427, Cl. 174-88.00R.
Pretchel, David A., 4,679,870, Cl. 439-493.000.
Solie, O. B.; and Pyle, Godfrey J., 4,679,851, Cl. 297-452.000.

Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., to Phillips Petroleum Company. Supported polyolefin catalyst components and methods of making and using same. 4,680,351, Cl. 526-125.000.

Mishkin, Martin A.: *See*—
Seiden, Paul; and Mishkin, Martin A., 4,680,184, Cl. 426-654.000.

Mitchell, Charles A.; Wawro, Thaddeus J.; Whipple, Charles E.; and Wright, William E., Sr., to Carrier Corporation. Molded drain connection with insert. 4,679,405, Cl. 62-285.000.

Mitchell, Hal D.; and Walker, Donald R., to Figgie International Inc. Shoulder pad truss arch system. 4,679,253, Cl. 2-2.000.

Mitlehner, Heinz; and Kolbesen, Bernd, to Siemens Aktiengesellschaft. Schottky power diode. 4,680,601, Cl. 357-15.000.

Mitsubishi Chemical Industries Limited: *See*—
Aoki, Motohisa; and Iwanaga, Hironobu, 4,680,246, Cl. 430-133.000.
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fukushima, Nobuo; and Iwata, Shuji, 4,680,629, Cl. 358-147.000.
Kaneyuki, Kazutoshi, 4,679,456, Cl. 74-752.00D.
Katayama, Kaneo; and Hashimoto, Yasuhiko, 4,679,494, Cl. 98-38.600.
Koike, Mitsuhiro; and Yakoh, Nobuaki, 4,679,437, Cl. 73-622.000.
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Tsujimura, Osamu; Hasegawa, Ryoei; and Ohkawa, Masayuki, 4,679,968, Cl. 407-114.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, 4,680,318, Cl. 521-95.000.
Kageyama, Yoshiteru, 4,680,140, Cl. 252-512.000.

Mitsubishi Rayon Company Limited: *See*—
Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.

Mitsui & Co., Ltd.: *See*—
Taga, Jun, 4,680,118, Cl. 210-493.100.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.

Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, to Hitachi, Ltd. Method and apparatus for conducting flow analysis. 4,680,270, Cl. 436-52.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.

Miura, Nobuo: *See*—
Abe, Masao; and Miura, Nobuo, 4,679,540, Cl. 123-602.000.

Miyabayashi, Tadao: *See*—
Yagi, Motoi; and Miyabayashi, Tadao, 4,680,631, Cl. 358-160.000.

Miyahara, Junji: *See*—
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.

Miyakawa, Akira: *See*—
Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, 4,680,802, Cl. 382-8.000.

Miyakawa, Masao. Timepiece. 4,679,945, Cl. 368-238.000.

Miyamoto, Junichi; and Tsujimoto, Jun-ichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 4,680,735, Cl. 365-210.000.

Miyamoto, Shoji: *See*—
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.

Miyawaki, Motohisa, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B. V. Control system for an infinitely variable transmission. 4,680,711, Cl. 364-424.100.

Miyazaki, Benichi: *See*—
Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, 4,680,662, Cl. 360-133.000.

Miyazaki, Kazuhiko: *See*—
Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, 4,680,491, Cl. 307-579.000.

Miyazaki, Takao; and Yamamoto, Hideo, to Clarion Co., Ltd. Magnetic video signal recording and reproducing system. 4,680,650, Cl. 360-33.100.

Miyazaki, Yoshiaki: *See*—
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, to Japan Steel Works, Ltd., The. Drive device for two-shaft extruding machine. 4,679,461, Cl. 74-665.0GA.

Mizuhara, Howard, to GTE Products Corporation. Ceramic and metal brazed articles. 4,679,960, Cl. 403-272.000.

Mizuno, Chiaki: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.

Mizuno, Ichiro: *See*—
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.

Mizuno, Isao: *See*—
Imamura, Masanaga; and Mizuno, Isao, 4,680,592, Cl. 346-1.100.

Mizusawa, Akira; and Nakama, Daiji, to Nifco, Inc. Ball joint. 4,679,958, Cl. 403-143.000.

Mizuta, Masaji: *See*—
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

Mizutani, Taku: *See*—
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

MKS Instruments, Inc.: *See*—
Ewing, James H., 4,679,585, Cl. 137-486.000.

Mobil Oil Corporation: *See*—
Abdo, Milton K.; and Jennings, Alfred R., Jr., 4,679,629, Cl. 166-281.000.
Mears, William G., 4,679,581, Cl. 137-43.000.

Mochida, Ei: *See*—
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.

Modern Home Products Corp.: *See*—
Koziol, Walter, 4,679,544, Cl. 126-41.00R.

Moghaddassi, Magid N.: *See*—
Porat, Itzchak; Grosberg, Percy; and Moghaddassi, Magid N., 4,679,784, Cl. 271-18.300.

Mohler, Robert D.: *See*—
Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, 4,680,267, Cl. 435-289.000.

Mohri, Satoshi: *See*—
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.

Molex Incorporated: *See*—
Triner, Irvin R.; and Bixler, Craig A., 4,679,879, Cl. 439-425.000.

Moller, Rudolf: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

Mollura, Carlos A. Airbed mattress including a regulated, controllable air reservoir therefor. 4,679,264, Cl. 5-453.000.

Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., to Graco Inc. Robot spray gun. 4,679,734, Cl. 239-692.000.

Momoi, Shoji; and Inami, Sumiaki, to Yamazaki Machinery Works, Ltd. Multiface machining machine tool. 4,679,286, Cl. 29-33.00P.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,680,081, Cl. 156-384.000.
Vanderpool, James L.; and Bain, James M., 4,680,078, Cl. 156-352.000.

Monastyrskaya, Galina S.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Monfort, Guy; Crahay, Jean; and Bragard, Adolphe, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Surface treatment of a rolling mill roll. 4,679,288, Cl. 29-121.800.

Monsanto Company: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., 4,680,212, Cl. 428-97.000.
Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.

Monte, Charles. Percussive action silent electronic keyboard. 4,679,477, Cl. 84-1.100.

Moore, David G.: *See*—
Foster, Donald D.; and Moore, David G., 4,679,712, Cl. 222-384.000.

Moore, Fergus E. Modular computer system with integral electronic bus. 4,680,674, Cl. 361-395.000.

Moore, John, to De la Rue Giori S.A. Method and arrangement for attaching printing plates to a plate cylinder. 4,680,067, Cl. 156-165.000.

Moran, Joseph M.: *See*—
Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., 4,680,084, Cl. 156-626.000.

Morgan, Thomas R., to Allied Corporation. Removal of ammonium ion from acidic liquors. 4,680,169, Cl. 423-53.000.

Mori, Teiichiro: *See*—
Osafune, Haruo; Kanbe, Sadao; Mori, Teiichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.

Mori, Yasuki: *See*—
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Morijiri, Takeshi: *See*—
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.

Morikawa, Keishi: *See*—
Kodama, Kazuo; and Morikawa, Keishi, 4,679,973, Cl. 409-200.000.
Morimoto, Akira: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,680,390, Cl. 540-228.000.
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. 6-O-methylerythromycin a derivative. 4,680,386, Cl. 536-7.400.
Morimura, Atsushi: *See*—
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.
Morin, Louis G., to American Cyanamid Company. Metal bonded composites and process. 4,680,093, Cl. 204-28.000.
Morin, Louis G., to American Cyanamid Company. Electrochemical cells and electrodes therefor. 4,680,100, Cl. 204-228.000.
Morishita, Hirosada: *See*—
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, to Omron Tateisi Electronics Co. Method of and apparatus for measuring moving velocity of linear object moving and vibrating. 4,679,932, Cl. 356-28.000.
Morita, Masayuki; and Hattori, Masaichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Apparatus for producing stepwise movement. 4,679,453, Cl. 74-128.000.
Morita, Tatsuo, to Nissan Motor Company, Limited. Engine combustion condition detecting system and method. 4,679,536, Cl. 123-425.000.
Moriya, Koichi: *See*—
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.
Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Method for recording and reproducing video format signal. 4,680,647, Cl. 358-343.000.
Morizuka, Kouhei, to Kabushiki Kaisha Toshiba. Method of manufacturing a heterojunction bipolar transistor having self-aligned emitter and base and selective isolation regions. 4,679,305, Cl. 29-576.300.
Morley, Robert A.; and Buick, James M., to Ferranti, plc. Projected imaged weapon training apparatus. 4,680,012, Cl. 434-22.000.
Morris, Steven L.; and Lewis, Gary C., to Motorola, Inc. Integrated circuit packaging. 4,680,471, Cl. 250-370.000.
Moser, Ludwig M.; and Kammermeier, Anton, to Westra Electronic GmbH. Hearing aid ear mold end piece for the auditory canal and hearing aid ear mold. 4,679,650, Cl. 181-130.000.
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, to Seiko Epson Kabushiki Kaisha. Method of preparing doped silica glass. 4,680,048, Cl. 65-17.000.
Motoki, Masanobu: *See*—
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
Motorola, Inc.: *See*—
Barbiaux, William J.; and Wineinger, Eugene L., 4,680,541, Cl. 324-128.000.
Benenati, Robert L.; and Moy, Wayne K., 4,680,527, Cl. 320-2.000.
Chiampas, George E.; Finnegan, John P.; and Villegas, Henry, 4,680,495, Cl. 310-220.000.
Ecklund, Lawrence M., 4,680,795, Cl. 381-15.000.
Giles, Grady L.; Wilson, Jesse R.; and Hulett, Terry V., 4,680,760, Cl. 371-21.000.
Krinock, Jerome V., 4,680,778, Cl. 375-97.000.
Marry, Patrick J., 4,680,787, Cl. 379-63.000.
Morris, Steven L.; and Lewis, Gary C., 4,680,471, Cl. 250-370.000.
Parker, Norman W., 4,680,794, Cl. 381-15.000.
Petratos, Nickie A.; Karl, David; and Bradford, William M., 4,680,676, Cl. 361-424.000.
Petrie, Adelore F., 4,680,667, Cl. 361-154.000.
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.
Moy, Wayne K.: *See*—
Benenati, Robert L.; and Moy, Wayne K., 4,680,527, Cl. 320-2.000.
MT Motoren-und Turbinen Union Munchen GmbH: *See*—
Wohrl, Bernhard; and Jabs, Alfred, 4,679,619, Cl. 165-81.000.
MTS Systems Corporation: *See*—
Maue, Dale N.; and Lund, Richard A., 4,679,591, Cl. 137-624.130.
Mueller, Otward M.: *See*—
Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.
Mukai, Seiichi: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.
Mukai, Yuji: *See*—
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.
Mukuda, Nobuo: *See*—
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.
Mullard, Bruce A.: *See*—
Lech, Thaddeus, Jr.; and Mullard, Bruce A., 4,679,679, Cl. 192-106.200.
Muller, Adam; and Goller, Ernst, to H. Stoll GmbH & Co. Flat-bed knitting machine having a spool table provided with movable yarn spool holders. 4,679,413, Cl. 66-125.00R.
Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, to Wacker-Chemie GmbH. Method for preparing acetoxysiloxanes and organo(poly)siloxanes having halogen bonded to silicon. 4,680,365, Cl. 528-15.000.
Muller, Klaus-Helmut: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Muller, Peter: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.
Multifastener Corporation: *See*—
Steward, John H.; and Ladouceur, Harold A., 4,679,690, Cl. 206-345.000.
Muneki, Koihiro: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.
Munro, Robert; and Day, Roger A., to AE PLC. Reinforced pistons. 4,679,493, Cl. 92-212.000.
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, to Ricoh Company, Ltd. Recording material for ink jet printing. 4,680,235, Cl. 428-414.400.
Murakami, Koso: *See*—
Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, 4,680,758, Cl. 370-110.200.
Murakami, Masaichi: *See*—
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.
Murakami, Shuzo: *See*—
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.
Murakami, Toshio, to Hitachi, Ltd. Signal processing circuit for a color video camera providing shading correction by varying the black clamping level. 4,680,624, Cl. 358-44.000.
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, to Hitachi, Ltd.; and Hitachi, Process Computer Engineering, Inc. Method of and apparatus for storing priority levels in token-ring network system. 4,680,757, Cl. 370-89.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,680,142, Cl. 252-522.00R.
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, to Sumitomo Chemical Company, Limited. Carbacyclin analogs. 4,680,307, Cl. 514-460.000.
Murata Manufacturing Co., Ltd.: *See*—
Yorita, Tadahiro; Matsumoto, Haruo; and Nakatsuji, Itsuo, 4,680,560, Cl. 333-206.000.
Murayama, Sadamitsu; and Tanaka, Makoto, to Teijin Limited. Chemical-resistant filter material. 4,680,221, Cl. 428-246.000.
Murayama, Toshiaki: *See*—
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.
Murdock, Bruce; and Teichmer, Daniel G., to Tektronix, Inc. Touch panel. 4,680,429, Cl. 178-19.000.
Muro, Hiroyuki: *See*—
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.
Murphy, John R.: *See*—
Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., 4,679,752, Cl. 244-158.00R.
Murphy, Richard J., to Polaroid Corporation, Patent Dept. Photographic processing composition with poly(diacetone acrylamide) oxime and styrene-butadiene latex. 4,680,247, Cl. 430-215.000.
Murray, Charles R., to C-I-L Inc. Thermoplastic sack. 4,680,207, Cl. 428-35.000.
Murray, James R.: *See*—
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., 4,679,297, Cl. 29-568.000.
Muskat, Irwin: *See*—
Sheehy, Roger C.; and Muskat, Irwin, 4,680,186, Cl. 426-129.000.
Sheehy, Roger C.; and Muskat, Irwin, 4,680,187, Cl. 426-129.000.
Mussari, Fred P. Adjustable bookholder. 4,679,757, Cl. 248-463.000.
Muto, Takashi, to Daido Metal Company Ltd. Method of producing sliding composite material. 4,680,161, Cl. 419-3.000.
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., to Allied Corporation. Deceleration and pressure sensitive propoptioning valve with low deceleration responsiveness. 4,679,864, Cl. 303-6.00C.
Myers, Ronald E.; and Buhks, Ephraim, to BF Goodrich Company, The. Electrodeless heterogeneous polypyrrole composite. 4,680,236, Cl. 428-515.000.
Myers, Ronald V.: *See*—
Clinton, Peter; Myers, Ronald V.; and Sinclair, David, 4,679,433, Cl. 73-304.00C.
N.K.F. Groep B.V.: *See*—
Grooten, Albertus T. M., 4,679,898, Cl. 350-96.230.
Nabeshima, Hiroichi: *See*—
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.
Nabisco Brands: *See*—
Spiel, Albert; and Spanier, Henry C., 4,680,190, Cl. 426-302.000.
Nabisco Brands, Inc.: *See*—
Simelunas, William J.; and Polifroni, Nicholas R., 4,679,496, Cl. 99-450.200.

Naem, Abdalla A.: *See—*
Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., 4,680,609, Cl. 357-42.000.

Nagamine, Kimihiro: *See—*
Hirota, Satoshi; and Nagamine, Kimihiro, 4,679,952, Cl. 400-279.000.

Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, to Toyota Jidosha Kabushiki Kaisha. Speed meter drive device for automobile. 4,679,449, Cl. 74-12.000.

Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly. 4,679,683, Cl. 192-89.00B.

Nagasawa, Yasuo: *See—*
Mikami, Toshio; and Nagasawa, Yasuo, 4,680,528, Cl. 320-32.000.

Nagashima, Shigeo: *See—*
Omoda, Koichiro; and Nagashima, Shigeo, 4,680,730, Cl. 364-900.000.

Nagata, Takeo: *See—*
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Nagata, Teruyuki: *See—*
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.

Nagel, Dietmar: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,680,020, Cl. 446-414.000.

Nagy, Francis J. Shelf filing system with identification handle for file pockets. 4,679,823, Cl. 281-15.00A.

Nagy, Laszlo, to General Motors Corporation. Multiratio power transmission. 4,679,455, Cl. 74-359.000.

Nagy, Richard A.: *See—*
McNeal, Norman E.; and Nagy, Richard A., 4,680,075, Cl. 156-289.000.

Naik, Appaya R.: *See—*
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,680,143, Cl. 252-553.000.

Naito, Hiroichi, to Fuji Photo Film Co., Ltd. Method and apparatus for reproducing magnetically recorded signals with a D.C. biasing magnetic field produced by a D.C. biasing coil. 4,680,657, Cl. 360-111.000.

Nakagawa, Akio; and Watanabe, Kiminori, to Kabushiki Kaisha Toshiba. Conductivity modulated MOS transistor device. 4,680,604, Cl. 357-23.400.

Nakagawa Corporation: *See—*
Nakagawa, Shigesaburo, 4,679,392, Cl. 59-35.100.

Nakagawa, Hideaki: *See—*
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, 4,680,318, Cl. 521-95.000.

Nakagawa, Katsumi: *See—*
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Nakagawa, Shigesaburo, to Nakagawa Corporation. Process for producing a garland chain. 4,679,392, Cl. 59-35.100.

Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, to Tokuyama Soda Kabushiki Kaisha. Process for preparation of fluorine containing polymer films. 4,680,355, Cl. 526-243.000.

Nakai, Masanori: *See—*
Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, 4,680,331, Cl. 524-269.000.

Nakajima, Nobuyoshi: *See—*
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.

Nakajima, Takeshi: *See—*
Sone, Masakazu; and Nakajima, Takeshi, 4,679,953, Cl. 400-625.000.

Nakama, Daiji: *See—*
Mizusawa, Akira; and Nakama, Daiji, 4,679,958, Cl. 403-143.000.

Nakamoto, Atsuhiro: *See—*
Matsumura, Masahiro; Ogasawara, Kenzi; Nakamoto, Atsuhiro; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.

Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, to Mitsubishi Rayon Company Limited. Ultraviolet curable ink composition. 4,680,368, Cl. 528-49.000.

Nakamura, Kenichiro, to Tsubakimoto Chain Co. Case for driving section of linear actuator. 4,679,451, Cl. 74-606.00R.

Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, to Hitachi, Ltd. Digital modulation apparatus. 4,680,556, Cl. 332-16.00R.

Nakamura, Toshio: *See—*
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Nakamura, Yoshinori: *See—*
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.

Nakanishi, Nobuyasu: *See—*
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.

Nakano, Masaki: *See—*
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Nakao, Yasuo: *See—*
Ikeda, Mitsuhiro; and Nakao, Yasuo, 4,679,863, Cl. 303-3.000.

Nakatani, Kazuo: *See—*
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Nakatsuji, Itsuo: *See—*
Yorita, Tadahiro; Matsumoto, Haruo; and Nakatsuji, Itsuo, 4,680,560, Cl. 333-206.000.

Nakatsuka, Katsuto: *See—*
Funaki, Takashi; and Nakatsuka, Katsuto, 4,679,775, Cl. 267-64.270.

Nakatsuka, Nobuo: *See—*
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.

Nakaya, Chitose: *See—*
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Nakayama, Hiroki: *See—*
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, 4,679,913, Cl. 350-423.000.

Nakayama, Kiyoharu: *See—*
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Nakazawa, Akira: *See—*
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Nakazawa, Tamotsu, to Canon Kabushiki Kaisha. Image processing system. 4,680,641, Cl. 358-257.000.

Nalco Chemical Company: *See—*
Fong, Dodd W., 4,680,339, Cl. 525-54.110.
Young, Paul R.; Koutek, Mary E.; and Kelly, John A., 4,680,124, Cl. 210-697.000.

Nanba, Keiichiro; Tokui, Satoru; and Onuma, Tatsuro, to Pioneer Electronic Corporation. System for processing picture information. 4,680,634, Cl. 358-181.000.

Nanbu, Morio: *See—*
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Narishige Corporation Limited: *See—*
Narishige, Eiichi; and Yoneyama, Shinji, 4,679,976, Cl. 414-4.000.

Narishige, Eiichi; and Yoneyama, Shinji, to Narishige Scientific Instrument Laboratory, Ltd.; and Narishige Corporation Limited. Manipulator usable for a glass electrode or the like. 4,679,976, Cl. 414-4.000.

Narishige Scientific Instrument Laboratory, Ltd.: *See—*
Narishige, Eiichi; and Yoneyama, Shinji, 4,679,976, Cl. 414-4.000.

Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami. Wheel cover mounting. 4,679,861, Cl. 301-37.00P.

Narumi China Corporation: *See—*
Kuroda, Toshio; and Kumazawa, Koichi, 4,680,618, Cl. 357-74.000.

Nash Engineering Company, The: *See—*
Olsen, Ole B., 4,679,987, Cl. 417-54.000.

Nash, John: *See—*
Kensey, Kenneth; and Nash, John, 4,679,558, Cl. 128-328.000.

Nash, Ruth E.: *See—*
Davis, William N., II; and Nash, Ruth E., 4,680,728, Cl. 364-900.000.

Nathoo, Nazim S.: *See—*
Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., 4,679,291, Cl. 29-432.000.

National Distillers and Chemical Corporation: *See—*
Huynh, Anh N.; and Ziogas, Phoivos D., 4,680,694, Cl. 363-136.000.

National Research Laboratories: *See—*
Maurer, Gerald L., 4,680,309, Cl. 514-499.000.

National Starch and Chemical Corporation: *See—*
Davis, Irwin J., 4,680,333, Cl. 524-394.000.

Naudi, Alain, to U.S. Philips Corporation. Automatic method and apparatus for dosing samples. 4,680,716, Cl. 364-468.000.

Naylor, Geoffrey; and Lawrence, Christopher J., to Rieter-Scragg Limited. Yarn entangling air jet. 4,679,284, Cl. 28-272.000.

Naylor, Harry B., to Pasco Laboratories, Inc. Method and apparatus for preventing cross-contamination of biochemical test wells in a microtiter test plate. 4,680,269, Cl. 435-301.000.

NCR Corporation: *See—*
Barnes, Lawrence C.; and Mankedick, Robert G., 4,680,622, Cl. 358-22.000.
Davis, William N., II; and Nash, Ruth E., 4,680,728, Cl. 364-900.000.
DiCenzo, Daniel A., 4,680,732, Cl. 364-900.000.
Dilella, Antonio, 4,680,803, Cl. 382-9.000.
Meguire, Patrick G.; and Pitoniak, Thomas J., 4,680,572, Cl. 340-365.00R.
Speraw, Floyd G., 4,680,425, Cl. 174-50.000.
Szluk, Nicholas J.; and Miller, Gayle W., 4,679,299, Cl. 29-571.000.
Watson, David A., 4,679,869, Cl. 439-78.000.

Neate, John A.: *See—*
Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., 4,679,291, Cl. 29-432.000.

NEC Corporation: *See—*
Kage, Kouzou, 4,680,772, Cl. 375-4.000.
Kato, Hideaki; and Araki, Shigeru, 4,680,791, Cl. 380-8.000.
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.
Obara, Takashi, 4,680,482, Cl. 307-279.000.
Okumura, Koichiro; and Ohkawa, Masayoshi, 4,680,488, Cl. 307-482.000.
Shimizu, Junzoh, 4,679,306, Cl. 29-576.00W.
Shirai, Tadao, 4,680,561, Cl. 333-208.000.
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12.000.
Watanabe, Hisatsune; and Usui, Akira, 4,680,602, Cl. 357-17.000.

Nelson, James L. Dispensing and cooling apparatus. 4,679,408, Cl. 62-390.000.

Nelson, Jeffrey D.; and Scanlon, John F., to Sundstrand Corporation. Ballistic tolerant dual load path ballscrew and ballscrew actuator. 4,679,485, Cl. 89-36.020.

Nelson, John C. Retrieving images stored on windowed discs. 4,679,922, Cl. 353-25.000.

Nelson, Peter; and Unger, Stefan H., to Syntex (U.S.A.) Inc. Anti-inflammatory guanidines. 4,680,300, Cl. 514-312.000.

Nelson, Stephen J., to Upjohn Company, The. Spiroketals and process for preparing same. 4,680,419, Cl. 549-343.000.

Neppl, Franz: *See*—
Hieber, Konrad; Neppl, Franz; and Schober, Konrad, 4,680,612, Cl. 357-71.000.

Nering, Eric A.: *See*—
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.

Nesbitt, R. Dennis: *See*—
Melvin, Terence; and Nesbitt, R. Dennis, 4,679,795, Cl. 273-235.00R.

Nestec S.A.: *See*—
Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, 4,679,701, Cl. 220-404.000.
Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.

Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., to General Motors Corporation. Electrical component packaging assembly. 4,679,885, Cl. 439-620.000.

Neumann, Leopold, to Analogic Corporation. Audio signal processing circuit for use in a hearing aid and method for operating same. 4,680,798, Cl. 381-68.400.

New Brunswick Scientific Company, Inc.: *See*—
Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, 4,680,267, Cl. 435-289.000.

New Energy Development Organization: *See*—
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

New England Digital Corporation: *See*—
Alonso, Sydney A., 4,680,479, Cl. 307-265.000.

New Zealand Steel Ltd: *See*—
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Newberry, Mark A.; and Kemper, Dennis C., to Gates Rubber Company, The. Safety hose. 4,679,599, Cl. 138-104.000.

Newman-Evans, Richard H., to Union Carbide Corporation. Epoxy resins based on tetraglycidyl diamines. 4,680,341, Cl. 525-113.000.

Newsom, Steven S.; and McCarthy, James M., to United States of America, Navy. Acoustic prelaunch weapon communication system. 4,680,584, Cl. 340-850.000.

Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., to International Business Machines Corporation. Rotating storage device track format emulation. 4,680,653, Cl. 360-72.200.

Nguyen, Tri Hue: *See*—
Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, 4,680,782, Cl. 378-4.000.

Nicholson Division, Datron Systems, Inc.: *See*—
Alesson, Thomas, 4,679,727, Cl. 236-56.000.

Nicholson Manufacturing Corporation: *See*—
Antezana, Luis F., 4,679,475, Cl. 83-420.000.

Nielsen, Bjarne M. Protecting device for transparencies. 4,679,923, Cl. 353-120.000.

Nielsen, Corine-Madeleine: *See*—
Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.

Nielsen, Darryl M.: *See*—
Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., 4,679,991, Cl. 417-360.000.
La Grange, Nyle D.; Nielsen, Darryl M.; and Harbison, Joe A., 4,680,437, Cl. 200-84.00R.

Nifco, Inc.: *See*—
Mizusawa, Akira; and Nakama, Daiji, 4,679,958, Cl. 403-143.000.

Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,679,721, Cl. 228-40.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.

Nii, Donald S.: *See*—
Harriman, Charles E.; and Nii, Donald S., 4,679,989, Cl. 417-238.000.

Niisato, Takeshi: *See*—
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, 4,679,718, Cl. 225-48.000.

Nikaido, Mitsuhiro: *See*—
Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, 4,680,466, Cl. 250-231.0SE.

Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, to Takeda Riken Kogyo Kabushikikaisha. Device for measuring average frequencies. 4,680,540, Cl. 324-78.00R.

Nilssen, Ole K. Inverter-type microwave oven power supply. 4,680,506, Cl. 315-102.000.

Nimmo, John R.: *See*—
Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., 4,679,422, Cl. 73-38.000.

Nippo Communication Industrial Co., Ltd.: *See*—
Akiyama, Tadahiko; and Otsuka, Yoshio, 4,680,785, Cl. 379-57.000.

Nippon Air Brake Co., Ltd.: *See*—
Ikeda, Mitsuhiro; and Nakao, Yasuo, 4,679,863, Cl. 303-3.000.
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.

Nippon Foil Manufacturing Co., Ltd.: *See*—
Kitamura, Hironori; and Noma, Kanji, 4,680,250, Cl. 430-302.000.
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Koyamato, Hisakazu, 4,679,479, Cl. 84-1.040.
Suzuki, Hideo, 4,679,480, Cl. 84-1.220.

Nippon Hoso Kyokai: *See*—
Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, 4,680,639, Cl. 358-224.000.

Nippon Kogaku K. K.: *See*—
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.
Yamada, Kenji, 4,679,921, Cl. 351-222.000.

Nippon Oil Co., Ltd.: *See*—
Matsubara, Saburo; and Yagi, Shinichi, 4,680,154, Cl. 264-63.000.

Nippon Paint Co., Ltd.: *See*—
Satoh, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotoshi, 4,680,348, Cl. 525-528.000.

Nippon Soda Co., Ltd.: *See*—
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Nippon Telegraph & Telephone Corporation: *See*—
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.

Nippon Telegraph & Telephone Public Corporation: *See*—
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.

Nippondenso Co., Ltd.: *See*—
Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, 4,680,608, Cl. 357-36.000.

Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, to Dainippon Screen Mfg. Co., Ltd. One-way reducing and enlarging printer. 4,679,930, Cl. 355-52.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Float device for small size boat. 4,679,522, Cl. 114-357.000.

Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, to Hitachi, Ltd. Posture judgement system in image processing. 4,680,802, Cl. 382-8.000.

Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, to Nissan Motor Co., Ltd. Variable capacity turbocharger control device. 4,679,398, Cl. 60-602.000.

Nishihara, Toshikazu: *See*—
Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, 4,680,218, Cl. 428-195.000.

Nishii, Masahiro: *See*—
Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, 4,680,054, Cl. 71-93.000.

Nishikawa, Masumi; and Ishikawa, Masanobu, to Aisin Seiki Kabushiki Kaisha. Back-lash eliminating mechanism in screw-type driving device. 4,679,457, Cl. 74-441.000.

Nishikawa, Reiji: *See*—
Sagoi, Masayuki; and Nishikawa, Reiji, 4,680,197, Cl. 427-129.000.

Nishimura, Masahiro: *See*—
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.

Nishimura, Shinji: *See*—
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.

Nishino, Keigo: *See*—
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.

Nishino, Tadashi: *See*—
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Nishioka, Masato: *See*—
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.

Nishiyama, Toshihiko: *See*—
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Nissan Motor Co., Ltd.: *See*—
Ito, Ken; and Kawabe, Taketoshi, 4,679,808, Cl. 280-91.000.
Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, 4,679,809, Cl. 280-91.000.
Kubo, Jun, 4,680,713, Cl. 364-426.000.
Kubo, Jun, 4,680,714, Cl. 364-426.000.
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.
Morita, Tatsuo, 4,679,536, Cl. 123-425.000.
Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, 4,679,398, Cl. 60-602.000.
Ozaki, Kiyotaka; Torii, Shuuji; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.

Nissei ASB Machine Co., Ltd.: *See*—
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.

Nitto Boseki Co., Ltd: *See*—
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.

NL Petroleum Products Limited: *See*—
Barr, John D.; and Wardley, Michael T., 4,679,639, Cl. 175-329.000.

Noble, Alfred H. Space frame apparatus and a space frame employing such apparatus. 4,679,372, Cl. 52-648.000.

Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Process for producing interferon. 4,680,261, Cl. 435-68.000.

Nogi, Teiji; and Gondo, Toyomi, to Kabushiki Kaisha Meidensha. Power supply installation for dc electric railroad. 4,680,663, Cl. 361-2.000.

Noguchi, Masato: *See*—
Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, 4,679,398, Cl. 60-602.000.

Noguchi, Noboru: *See*—
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.

Noll, Hans: *See*—
Flindt, Werner; and Noll, Hans, 4,679,722, Cl. 228-168.000.

Noma, Kanji: *See*—
Kitamura, Hironori; and Noma, Kanji, 4,680,250, Cl. 430-302.000.
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Nomura, Setsuo; and Isakozawa, Shigeto, to Hitachi, Ltd. Focusing device for a television electron microscope. 4,680,469, Cl. 250-311.000.

Nomura, Yoichi: *See*—
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.

Nonomura, Arthur M., to Microbio Resources, Inc. Process for producing a naturally-derived carotene/oil composition by direct extraction from algae. 4,680,314, Cl. 514-725.000.

Nordskog, Robert A. Lightweight aircraft furniture caster assembly having a notched braking plate engaged by a brake. 4,679,662, Cl. 188-1.120.

Nordson Corporation: *See*—
Jameson, Calvin R.; and Ramazzotti, Dario J., 4,679,710, Cl. 222-190.000.
Trevathan, Larry C., 4,679,711, Cl. 222-330.000.

North American Philips Consumer Electronics Corp.: *See*—
Collins, Floyd K.; and Hassler, George E., 4,680,501, Cl. 313-456.000.

North American Philips Corporation: *See*—
McKechnie, Thomas S.; and Goldenberg, Jill F., 4,679,900, Cl. 350-126.000.

North American Specialties Corporation: *See*—
Seidler, Jack, 4,679,889, Cl. 439-876.000.

Northern Telecom Limited: *See*—
Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., 4,680,609, Cl. 357-42.000.
Este, Grantley O., 4,680,497, Cl. 310-313.00C.
Goodwin, John C., 4,679,908, Cl. 350-320.000.
Grover, Wayne D., 4,680,583, Cl. 340-825.520.
Heldenbrand, Stanley W.; and Chappuis, Clyde L., 4,679,867, Cl. 312-287.000.
Rioux, Brian A., 4,680,008, Cl. 432-72.000.
Theriault, Robert E.; and Hogeboom, John G., 4,679,302, Cl. 29-571.000.

Northwest Marine Technology Inc.: *See*—
Jefferts, Keith B., 4,679,559, Cl. 128-330.000.

Nortrup, Kevin E.: *See*—
Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., 4,680,511, Cl. 315-411.000.

Notthoff, Johannes K.: *See*—
Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., 4,679,298, Cl. 29-571.000.

Nova Technologies, Inc.: *See*—
DiMatteo, Paul; and Chubb, Charles F., 4,679,259, Cl. 5-81.00R.

Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., to Owens-Illinois, Inc. Apparatus for applying labels in the molds of a plastic blow molding machine. 4,680,000, Cl. 425-126.00R.

Nowicki, Casimir W.: *See*—
Plenzler, John A.; Krall, Thomas J.; and Nowicki, Casimir W., 4,679,997, Cl. 425-126.00R.

NSK-Warner Kabushiki Kaisha: *See*—
Yamamoto, Kazuo; and Asano, Shuichi, 4,679,821, Cl. 280-808.000.

Nukui, Masahiro: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.

Numata, Kazuo: *See*—
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

Nussbaumer, Manfred; and Fischer, Bruno, to Micafil AG. Methods and apparatus for the automatic production of stators for electric motors. 4,679,312, Cl. 29-596.000.

Obara, Takashi, to NEC Corporation. Inverter for use in binary counter. 4,680,482, Cl. 307-279.000.

Ober, Christopher K.: *See*—
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., 4,680,332, Cl. 524-377.000.

Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, to Shin Nisso Kako Co., Ltd. Chromogenic materials employing fluoran compounds. 4,680,598, Cl. 503-217.000.

Ochi, Yoshiyuki: *See*—
Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.

Ochiai, Kensuke: *See*—
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, 4,679,718, Cl. 225-48.000.

Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Esters of 7-[2-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]-3-methyl-ceph-3-em-4-carboxylic acid. 4,680,390, Cl. 540-228.000.

O'Connor, James E., to Phillips Petroleum Company. Reinforced plastic. 4,680,224, Cl. 428-294.000.

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Ishii, Susumu; and Oda, Kiyoshi, 4,679,281, Cl. 24-422.000.

Odet, Philippe: *See*—
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.

O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., to General Electric Company. Method for homogenizing a static magnetic field over an arbitrary volume. 4,680,551, Cl. 324-320.000.

Ogarkov, Vsevolod I.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Ogasawara, Kenzi: *See*—
Matsumura, Masahiro; Ogasawara, Kenzi; Nakamoto, Atsuhiro; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.

Ogawa, Genshiro. Electronically-controlled heating device for infusion liquids. 4,680,445, Cl. 219-299.000.

Ogawa, Hiromi: *See*—
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.

Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, to Fuji Photo Film Co., Ltd. Magnetic tape having a leader tape. 4,680,225, Cl. 428-323.000.

Ogawa, Naoki: *See*—
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.

Ogawa, Tetsuo: *See*—
Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, 4,680,763, Cl. 371-37.000.

Ogawa, Tetsuya: *See*—
Isoyama, Toyoshiro; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,680,137, Cl. 252-299.620.

Ohara, Tsunemasa: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.

Ohaus Scale Corporation: *See*—
Brock, Marilyn A.; and Scheffer, Daniel G., 4,679,642, Cl. 177-164.000.

Ohio University: *See*—
Collier, John R., 4,680,156, Cl. 264-171.000.

Ohira, Hiroyuki: *See*—
Ota, Minemasa; Matsumoto, Osamu; and Ohira, Hiroyuki, 4,680,745, Cl. 369-45.000.

Ohkawa, Masayoshi: *See*—
Okumura, Koichiro; and Ohkawa, Masayoshi, 4,680,488, Cl. 307-482.000.

Ohkawa, Masayuki: *See*—
Tsujimura, Osamu; Hasegawa, Ryoei; and Ohkawa, Masayuki, 4,679,968, Cl. 407-114.000.

Ohnishi, Makoto: *See*—
Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, 4,680,556, Cl. 332-16.00R.

Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy assembly. 4,680,018, Cl. 446-376.000.

Ohtsuki, Kazuhiko: *See*—
Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, 4,679,673, Cl. 192-21.000.

Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English). Hydraulic type starting clutch. 4,679,677, Cl. 192-85.0AA.

Oishi, Kanji; and Shinoda, Takashi, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,680,737, Cl. 365-222.000.

Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,680,661, Cl. 360-133.000.

Oizumu, Kouji: *See*—
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, 4,679,913, Cl. 350-423.000.

Okada, Kazuo, to Kabushiki Kaisha Universal. Video game apparatus with automatic skill level adjustment. 4,679,789, Cl. 273-1.00E.

Okamoto, Shigeo; and Shiozaki, Tomoharu, to Kanzaki Paper Manufacturing Co. Ltd. Self-contained type pressure sensitive record sheet. 4,680,597, Cl. 503-214.000.

Okamura, Kyuya: *See—*
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.

Okamura, Masayuki, to Aisan Kogyo Kabushiki Kaisha. Throttle sensor for engine. 4,679,440, Cl. 73-118.100.

Oki Electric Industry Co., Ltd.: *See—*
Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, 4,680,491, Cl. 307-579.000.

Okin, Seth. Dental appliance for cleansing the gingival one third areas of the teeth as well as the sulcular and the embrasure regions thereof. 4,679,273, Cl. 15-167.00R.

Okojima, Sumio: *See—*
Yuhara, Yukitomo; Okojima, Sumio; and Ishikawa, Tatsuo, 4,679,576, Cl. 132-82.00R.

Okuhara, Masakuni: *See—*
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.

Okumura, Koichiro; and Ohkawa, Masayoshi, to NEC Corporation. MOSFET-type driving circuit with capacitive bootstrapping for driving a large capacitive load at high speed. 4,680,488, Cl. 307-482.000.

Okuyama, Shinya: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, to Hitachi, Ltd. Method of controlling inverter-driven induction motor. 4,680,526, Cl. 318-802.000.

Oliff, James R., to Mead Corporation, The. End closure structure for an end loading carton. 4,679,726, Cl. 229-138.000.

Olsen, John H., to Flow Industries, Inc. High pressure hose fitting. 4,679,826, Cl. 285-149.000.

Olsen, Ole B., to Nash Engineering Company, The. Self-priming liquid ring pump methods and apparatus. 4,679,987, Cl. 417-54.000.

Olson, Daniel H., to Snyder Laboratories, Inc. Pressure relief valve. 4,679,596, Cl. 137-853.000.

Olson, Kenneth C.: *See—*
Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, 4,680,262, Cl. 435-68.000.

Olson, Rohn L.: *See—*
Kramer, Kenneth D.; and Olson, Rohn L., 4,679,765, Cl. 251-38.000.

Olver, Laurence C.: *See—*
Lakhani, Amir A.; and Olver, Laurence C., 4,679,311, Cl. 29-579.000.

Olympus Optical Co., Ltd.: *See—*
Horiguchi, Toshio, 4,680,643, Cl. 358-280.000.
Ishiwatari, Shiro, 4,680,102, Cl. 204-299.00R.

Omoda, Koichiro; and Nagashima, Shigeo, to Hitachi, Ltd. Storage control apparatus. 4,680,730, Cl. 364-900.000.

Omron Tateisi Electronics Co.: *See—*
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.
Sakamoto, Tamaki, 4,679,949, Cl. 374-183.000.

Omura, Sadafumi: *See—*
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

Ong, Sienling: *See—*
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.

Ono, Keiichi: *See—*
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Ono, Naoya: *See—*
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.

Ono, Yutaka: *See—*
Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, 4,680,466, Cl. 250-231.0SE.

Onodera, Toshihiro: *See—*
Tanaka, Yoshio; and Onodera, Toshihiro, 4,680,534, Cl. 323-290.000.

Onorato, Paulette I. K.; and Su, Sophia R., to GTE Laboratories Incorporated. Process for molding optical components of silicate glass to a near net shape optical precision. 4,680,049, Cl. 65-18.100.

Onuma, Tatsuro: *See—*
Nanba, Keiichiro; Tokui, Satoru; and Onuma, Tatsuro, 4,680,634, Cl. 358-181.000.

Ooi, Kazushige, to Kabushiki Kaisha Toshiba. Driver circuit for two-dimensional image sensor. 4,680,636, Cl. 358-213.180.

Opie, Eric A.; and Clement, Thomas J., to E. R. Squibb & Sons, Inc. Electrodynamic transluminal angioplasty system. 4,679,557, Cl. 128-305.000.

Oppenlander, Jon E.: *See—*
Sheehan, Neil J.; Oppenlander, Jon E.; and Fleenor, Richard P., 4,679,446, Cl. 73-864.130.

Opsal, Jon: *See—*
Rosencwaig, Allan; and Opsal, Jon, 4,679,946, Cl. 374-5.000.

Optotech, Inc.: *See—*
Bracht, Roger R., 4,680,594, Cl. 346-108.000.

Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, to W. R. Grace & Co., Cryovac Div. Easy to open package and a method of making same. 4,680,340, Cl. 525-72.000.

Orero, Francisco O.; and Garcia, Augusto M. Flag having a support pedestal. 4,679,523, Cl. 116-173.000.

Organon Teknika Corporation: *See—*
Barone, David, 4,680,122, Cl. 210-637.000.

Orimoto, Hiroyuki: *See—*
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.

Orlando, John J., to Inco Alloys International, Inc. Rotary mill and a method of charging the mill. 4,679,736, Cl. 241-25.000.

Orlando, Thomas W., to Alcor, Inc. Controlled atmosphere oven. 4,680,167, Cl. 422-199.000.

Ornstein, Jacob L.; and Hydock, Michael A., to GTE Products Corporation. Thermostatic metal. 4,680,238, Cl. 428-617.000.

Orphall, Axel W., to Stedman Machine Co. Wedge-clamp assembly for an impact crusher. 4,679,740, Cl. 241-189.00R.

Orr, Stephen M.: *See—*
Maccarone, Anthony J.; and Orr, Stephen M., 4,679,702, Cl. 220-90.200.

Orsini, Jean: *See—*
Coates, Fredrica V.; Jannoni, Richard; and Orsini, Jean, 4,680,030, Cl. 604-391.000.

Orszulak, James H.: *See—*
Wertz, Ronald D.; Orszulak, James H.; and Sweeney, Christopher L., 4,680,599, Cl. 340-744.000.

Ortho Pharmaceutical: *See—*
Kung, Patrick C.; and Goldstein, Gideon, 4,680,383, Cl. 530-387.000.

Osafune, Haruo; Kanbe, Sadao; Mori, Teiichiro; and Ikejiri, Masahisa, to Seiko Epson Kabushiki Kaisha. Method of preparing tubular silica glass. 4,680,045, Cl. 65-17.000.

Osafune, Haruo: *See—*
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.

Osato, Yasukuni: *See—*
Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, 4,680,449, Cl. 219-385.000.

Osawa, Keishi: *See—*
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, 4,680,669, Cl. 361-230.000.

Osetec, Marc: *See—*
Malka, Jacob H.; and Osetec, Marc, 4,680,726, Cl. 364-721.000.

Ota, Minemasa; Matsumoto, Osamu; and Ohira, Hiroyuki, to Pioneer Electronic Corporation. Optical disk recording apparatus. 4,680,745, Cl. 369-45.000.

Otis Elevator Company: *See—*
Gibson, William H., 4,679,661, Cl. 187-20.000.

Otsuka, Yoshio: *See—*
Akiyama, Tadahiko; and Otsuka, Yoshio, 4,680,785, Cl. 379-57.000.

Ott, Granville E., to Texas Instruments Incorporated. Optical system for projection display using spatial light modulator device. 4,680,579, Cl. 340-783.000.

Otten, Henricus J. M.: *See—*
Sijbers, Peter J. M.; Otten, Henricus J. M.; and Van Der Plaats, Petrie J., 4,680,789, Cl. 379-395.000.

Ou, A- Lin. Cleaning means for vehicle exhausting pipe. 4,679,395, Cl. 60-319.000.

Ouchi, Norman K.: *See—*
Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., 4,680,653, Cl. 360-72.200.

Ouintel, Francis W., to Sheehan, Robert Douglas. Lawn edger. 4,679,383, Cl. 56-13.400.

Ovchinnikov, Jury A.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Overbay, Mark A., to Combustion Engineering, Inc. Hydraulic tube plug remover. 4,679,315, Cl. 29-726.000.

Overbergh, Noel: *See—*
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,680,065, Cl. 156-49.000.

Ovonic Imaging Systems, Inc.: *See—*
Vijan, Meera; McGill, John C.; and Day, Paul N., 4,680,085, Cl. 156-643.000.

Owens-Illinois, Inc.: *See—*
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.
Plenzler, John A.; Krall, Thomas J.; and Nowicki, Casimir W., 4,679,997, Cl. 425-126.00R.

Oy Wartsila AB: *See—*
Ekblom, Karl-Erik, 4,679,376, Cl. 53-137.000.
Eklund, Dan, 4,679,524, Cl. 118-122.000.

Ozaki, Kiyotaka; Torii, Shuuji; Jindo, Tomio; and Imaseki, Takashi, to Nissan Motor Co., Ltd. Limited slip differential. 4,679,463, Cl. 74-711.000.

Ozawa, Takashi: *See—*
Sato, Shigeru; and Ozawa, Takashi, 4,680,477, Cl. 250-578.000.

P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,680,215, Cl. 428-107.000.
Pace, Jerry E.: *See*—
Holmes, Gerald E.; and Pace, Jerry E., 4,679,978, Cl. 414-563.000.
Packard, Richard F.; and Cover, Kenneth R., to Joerns Healthcare, Inc. Bedside control module for healthcare stations and the like. 4,680,790, Cl. 379-432.000.
Pai, Rong-Chang: *See*—
Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, 4,680,262, Cl. 435-68.000.
Paleschuck, Maurice. Compactor receptacle. 4,680,808, Cl. 383-9.000.
Pammer, Erich, to Siemens Aktiengesellschaft. Semiconductor component comprising bump-like, metallic lead contacts and multilayer wiring. 4,680,610, Cl. 357-68.000.
Pandey, Sue D.; and Buss, Waldeen C., to Chevron Research Company. Sulfur tolerance of zeolitic reforming catalysts. 4,680,280, Cl. 502-66.000.
Pape, Gebhard: *See*—
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.
Parker, David H. Waterproof flashlight. 4,680,682, Cl. 362-158.000.
Parker Hannifin Corporation: *See*—
Stevens, Curtis E., 4,680,465, Cl. 250-229.000.
Parker, Norman W., to Motorola, Inc. AM stereo system with modified spectrum. 4,680,794, Cl. 381-15.000.
Parnoff, George K.; and Sultan, Steven L., to Andros Analyzers Incorporated. Adaptor assembly for airway tube. 4,679,573, Cl. 128-716.000.
Parsons, James S.; and Gasaway, Jack S., to Injet Medical Products, Inc. Needleless hypodermic injection device. 4,680,027, Cl. 604-68.000.
Pascal, Roger; and Dimier, Jean P., to Salomon S.A. Safety ski binding. 4,679,815, Cl. 280-618.000.
Pasco Laboratories, Inc.: *See*—
Naylor, Harry B., 4,680,269, Cl. 435-301.000.
Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boiti, Franco, to Ruco Equipment Company, Inc. Highly maneuverable insulated man lifting aerial crane for use in servicing overhead high-voltage electrical transmission lines. 4,679,653, Cl. 182-2.000.
Pastor, Ricardo C., to Hughes Aircraft Company. Method of modifying the refractive index of fluoride glass. 4,680,044, Cl. 65-3.110.
Patchett, Arthur A.: *See*—
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,680,392, Cl. 540-527.000.
Patel, Gautam A.: *See*—
Factor, Arnold; and Patel, Gautam A., 4,680,232, Cl. 428-412.000.
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., to Institute Problem Modelirovania v Energetike a An USSR. Welder's trainer. 4,680,014, Cl. 434-234.000.
Patterson, Joseph M.: *See*—
Ramsden, Hugh E.; and Patterson, Joseph M., 4,680,120, Cl. 210-635.000.
Patterson, Joseph M., III: *See*—
Ramsden, Hugh E.; and Patterson, Joseph M., III, 4,680,121, Cl. 210-635.000.
Paugam, Francois: *See*—
Vernois, Michel; and Paugam, Francois, 4,680,219, Cl. 428-222.000.
Paul Troester Machinenfabrik: *See*—
Dallmaier, Gunter, 4,679,743, Cl. 242-54.00R.
Pavlath, George A., to Litton Systems, Inc. Electrically switched fiber optic directional coupler. 4,679,894, Cl. 350-96.150.
Pawelek, Bernd-Christian, to Teldix GmbH. Method for navigating vehicles, particularly land vehicles. 4,680,715, Cl. 364-449.000.
Pawlak, Joseph A.: *See*—
Rosenfeld, Jerold C.; and Pawlak, Joseph A., 4,680,371, Cl. 528-179.000.
Pay, Christopher C., to Crop Control Products Limited. Electrostatic spraying apparatus. 4,679,735, Cl. 239-708.000.
Payne, Donald W.; and Hemp, Bruce, to Payne, Donald W. Three-phase ac to dc power converter with power factor correction. 4,680,689, Cl. 363-26.000.
Payne, Marshall W.: *See*—
Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., 4,680,571, Cl. 340-52.00R.
Pearse, Richard H., Jr., to American Standard Inc. Stepped capacity constant volume building air conditioning system. 4,679,411, Cl. 62-519.000.
Pecheux, Jean-Claude R., to Compagnie Generale de Material Orthopedique. Re-education apparatus for the articulated segments of the hand. 4,679,548, Cl. 128-26.000.
Peeters, Robert D. Loudspeaker enclosure. 4,679,651, Cl. 181-155.000.
Pennwalt Corporation: *See*—
Bross, Charles F., 4,680,464, Cl. 250-223.00R.
Wheaton, Gregory A., 4,680,095, Cl. 204-79.000.
Penzo, Alessandro: *See*—
Ciordinik, Jacques; and Penzo, Alessandro, 4,680,573, Cl. 340-541.000.
Perkins, Thomas K., to Atlantic Richfield Company. Energy efficient process for viscous oil recovery. 4,679,626, Cl. 166-248.000.
Perkins, William O.: *See*—
Fulton, Temple L.; and Perkins, William O., 4,680,753, Cl. 370-85.000.
Permaswage S.A.: *See*—
Bernardot, Christian, 4,679,828, Cl. 285-175.000.
Perne, Raymond: *See*—
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.
Petersen, Kurt E.: *See*—
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.
Peterson, Duane G. Wire fence post bracing system. 4,679,772, Cl. 256-36.000.
Peterson, John F.: *See*—
Lessard, Philip A.; Bartlett, Allen J.; and Peterson, John F., 4,679,401, Cl. 62-55.500.
Peterson, Mitchell F.: *See*—
Wales, C. Ernest; and Peterson, Mitchell F., 4,680,741, Cl. 367-189.000.
Peterson, Paul F., to Lockheed Corporation. Weapon dispensing system for an aircraft. 4,679,751, Cl. 244-137.400.
Petitimbert, Jean-Francois: *See*—
Chapsal, Paul; and Petitimbert, Jean-Francois, 4,680,686, Cl. 363-10.000.
Petitjean, Robert; and Eriksson, Bo G., to Tour & Andersson AB. Apparatus and method for regulating flow and temperature in a central heating installation. 4,679,729, Cl. 237-8.00R.
Petratos, Nickie A.; Karl, David; and Bradford, William M., to Motorola, Inc. Portable radio housing with logic and RF shielding. 4,680,676, Cl. 361-424.000.
Petrie, Adelore F., to Motorola, Inc. Solenoid driver control unit. 4,680,667, Cl. 361-154.000.
Pettinga, Frederic R.; and Goodman, Steve F., to Herman Miller, Inc. Rail panel mounting latch. 4,679,368, Cl. 52-36.000.
Peyrelongue, Jean-Pierre: *See*—
Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, 4,679,755, Cl. 248-74.100.
Pfeifer, Josef, to Ciba-Geigy Corporation. Homopolymers, copolymers and coated material and its use. 4,680,195, Cl. 427-44.000.
Pfestorf, Harald: *See*—
Creydt, Martin; Bickle, Wolfgang; and Pfestorf, Harald, 4,679,681, Cl. 192-107.00M.
Pfister, Theodor: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Pfizer Inc.: *See*—
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,680,404, Cl. 546-269.000.
Lipinski, Christopher A., 4,680,306, Cl. 514-389.000.
pHarma-medica a-s: *See*—
Buchardt, Ole, 4,680,399, Cl. 546-139.000.
Philipp, Clemens: *See*—
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Phillips Petroleum Company: *See*—
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,680,105, Cl. 208-251.00H.
DeLong, Bradley W., 4,680,041, Cl. 62-11.000.
Leland, John E.; Dix, James S.; and Wright, Roy F., 4,680,326, Cl. 524-106.000.
Megee, Bryan A.; and Whiteside, James D., II, 4,679,579, Cl. 137-13.000.
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,680,351, Cl. 526-125.000.
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Yoxon, Brian; and Thilwind, William, 4,680,206, Cl. 528-34.000.
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Roberts, Michael, 4,679,891, Cl. 350-1.300.
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Murphy, Richard J., 4,680,247, Cl. 430-215.000.

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Turner, Norman L.; and Pollock, John D., 4,680,474, Cl. 250-492.200.

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Frisch, Kurt C.; and Ashida, Kaneyoshi, 4,680,214, Cl. 428-107.000.

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Biletch, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., 4,680,337, Cl. 525-53.000.

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Graham, Everett S., 4,680,321, Cl. 523-335.000.

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Lahr, Helfrid; and Pontani, Bernd, 4,680,159, Cl. 376-272.000.

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Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.

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Gotzenbrucker, Oswald; and Popp, Gerhard, 4,680,615, Cl. 357-55.000.

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Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, 4,680,590, Cl. 342-457.000.

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Gregory, Mark, 4,679,728, Cl. 237-1.00R.

Powell, Homer M.: *See*—
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.

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Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., 4,680,346, Cl. 525-486.000.
Darlington, W. Bruce; and DuBois, Donald W., 4,680,101, Cl. 204-295.000.
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.
Koontz, Harry S., 4,679,331, Cl. 33-551.000.

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Krafcik, Joseph T.; Barnes, Richard J.; and Goetter, Erwin H., 4,679,896, Cl. 350-96.200.

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Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, 4,680,365, Cl. 528-15.000.

Prescher, Gunter: *See*—
Andrade, Juan; and Prescher, Gunter, 4,680,420, Cl. 549-476.000.

Prescolite, Inc.: *See*—
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Scelba, Stephen S., 4,679,419, Cl. 70-312.000.

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Puhler, Alfred; Simon, Reinhard; and Priefer, Ursula, 4,680,264, Cl. 435-172.300.

Prien, Manfred: *See*—
Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.

Priesnitz, Uwe: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.

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Blanchard, Gilbert; and Prigent, Michel, 4,680,282, Cl. 502-304.000.

Prince Corporation: *See*—
Spykerman, Scott A., 4,679,843, Cl. 296-97.00K.

Prisco, Anthony J.; and Johnson, Alfred N., to Westinghouse Electric Corp. Conveyor for sorting radioactive waste. 4,679,738, Cl. 241-101.200.

Pro-Catalyse: *See*—
Blanchard, Gilbert; and Prigent, Michel, 4,680,282, Cl. 502-304.000.

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Foster, Joseph S., 4,679,538, Cl. 123-525.000.

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Seiden, Paul; and Mishkin, Martin A., 4,680,184, Cl. 426-654.000.

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Busch, Alfred; and St. Laurent, James C. T. B., 4,680,131, Cl. 252-102.000.

Progenics, Inc.: *See*—
Applezweig, Norman, 4,680,289, Cl. 514-172.000.

Protein's Technology S.p.A., The: *See*—
Manola, Umberto, 4,680,107, Cl. 209-139.200.

Proulx, Raymond E.; and Rauscher, Frank J. Venipuncture site protector. 4,679,553, Cl. 128-133.000.

Pugh, R. Dell. Vehicle performance computer. 4,680,453, Cl. 235-88.00R.

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Pupillo, Dominic S.; and Scheff, Luben, to General Motors Corporation. Closure latch. 4,679,836, Cl. 292-216.000.

Purdy, Edmund R.: *See*—
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.

Putsch, Peter-Ulrich; and Cremer, Heinz P., to Keiper Recaro GmbH & Co. Vehicle seat. 4,679,854, Cl. 297-486.000.

Pyle, Godfrey J.: *See*—
Solie, O. B.; and Pyle, Godfrey J., 4,679,851, Cl. 297-452.000.

Quam, Dorothy M.: *See*—
Quam, William M.; and Quam, Dorothy M., 4,679,549, Cl. 128-57.000.
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Quam, William M.; and Quam, Dorothy M. Integral foot massage and support apparatus. 4,679,550, Cl. 128-57.000.
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Kambic, Raymond V., 4,679,416, Cl. 70-143.000.
Raab, Andrew F.; and Cobb, Albert R., III, to Indak Manufacturing Corp. Combination rotary electrical switch and vacuum selector valve. 4,679,588, Cl. 137-560.000.
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, to Holstein und Kappert GmbH. Filling machine for filling liquid under counterpressure. 4,679,603, Cl. 141-39.000.
Radunz, Hans-Eckart: *See*—
Irmscher, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, 4,680,288, Cl. 514-63.000.
Rafael, Werner: *See*—
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Raffel, Peter: *See*—
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.
Raines, Charles D.: *See*—
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Raj Technology, Inc.: *See*—
Sandhu, Jaswinder S., 4,679,436, Cl. 73-603.000.
Rajagopal, Ganesh: *See*—
Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617.000.
Ramachandra, Govardhan; and Bhatt, Kiran M., to Advanced Micro Devices, Inc. Method of making improved metal silicide fuse for integrated circuit structure. 4,679,310, Cl. 29-577.00R.
Raman, Gopalan: *See*—
Cruz-Uribe, Antonio S.; Hubbard, David W.; and Raman, Gopalan, 4,680,595, Cl. 346-140.00R.
Ramazzotti, Dario J.: *See*—
Jameson, Calvin R.; and Ramazzotti, Dario J., 4,679,710, Cl. 222-190.000.
Ramer, O. Glenn, to Hughes Aircraft Company. High switching frequency optical waveguide switch, modulator, and filter devices. 4,679,893, Cl. 350-96.140.
Ramos, Remigio R.: *See*—
Goding: David J.; and Ramos, Remigio R., 4,679,506, Cl. 105-136.000.
Ramprasad, Dorai; and Busch, Daryle H., to Air Products and Chemicals, Inc. Lacunar cobalt complexes for oxygen separation. 4,680,037, Cl. 55-16.000.
Ramsden, Hugh E.; and Patterson, Joseph M., to J. T. Baker Chemical Company. Bonded phase of silica and carboalkoxyalkyl silanes for solid phase extraction. 4,680,120, Cl. 210-635.000.
Ramsden, Hugh E.; and Patterson, Joseph M., III, to J. T. Baker Chemical Company. Bonded phase of silica for solid phase extraction. 4,680,121, Cl. 210-635.000.
Ramsey, Wayne H., to TRW Inc. Attachment of electric cable to submergible pump motor heads. 4,679,875, Cl. 439-604.000.
Ramuz, Henri: *See*—
Hengartner, Urs; and Ramuz, Henri, 4,680,310, Cl. 514-539.000.
Rando, Joseph F.: *See*—
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.
Ranford, Alan B.; and Fecht, David C., to Sherwood Medical Company. Vena caval catheter. 4,680,029, Cl. 604-280.000.
Rao, Vittal R., to Ciba-Geigy Corporation. 6-isothiocyanato-2,5-substituted benzothiazoles or benzoxazoles useful as anthelmintic effective agents. 4,680,301, Cl. 514-321.000.
Rask, Richard O.: *See*—
Delmege, Dale; and Rask, Richard O., 4,679,950, Cl. 384-18.000.
Rasmussen, Robert, to Accurate Industries, Inc. Method of unloading large containers. 4,679,979, Cl. 414-786.000.
Rassaian, Mostafa, to General Motors Corporation. Three-axle railway truck steering linkage. 4,679,507, Cl. 105-136.000.
Rattlingourd, Glen D.: *See*—
Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., 4,680,759, Cl. 370-112.000.
Rauchholz, Alvin W.: *See*—
Dosaj, Vishu D.; and Rauchholz, Alvin W., 4,680,096, Cl. 204-164.000.
Rauscher, Frank J.: *See*—
Proulx, Raymond E.; and Rauscher, Frank J., 4,679,553, Cl. 128-133.000.
Rauthmann, Axel: *See*—
Pietryk, Erwin; and Rauthmann, Axel, 4,679,983, Cl. 415-152.00A.
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, to International Hydron Corporation. Mold and method for spin casting a precisely configured article. 4,680,149, Cl. 264-2.100.
Raybon, Johnny D. Wheelchair cart. 4,679,807, Cl. 280-65.000.
Raychem Corporation: *See*—
Camin, Geary E.; and Uken, William D., 4,680,233, Cl. 428-424.600.
Campbell, Bruce D.; Triplett, James T.; and Tylor, Richard E., 4,679,907, Cl. 350-320.000.
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,680,065, Cl. 156-49.000.
Raypak, Inc.: *See*—
Cavestany, Adrian V., 4,679,545, Cl. 126-350.00R.
Raytheon Company: *See*—
Cantwell, Robert H., 4,680,588, Cl. 342-92.000.
RCA Corporation: *See*—
Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., 4,680,511, Cl. 315-411.000.
Giordano, Raymond L., 4,680,483, Cl. 307-355.000.
Helvy, Fred A.; and McDonie, Arthur F., 4,680,504, Cl. 313-524.000.
Willis, Donald H.; Fling, Russell T.; and Christopher, Todd J., 4,680,632, Cl. 358-166.000.
Reale, Louis: *See*—
Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., 4,680,040, Cl. 55-387.000.
Realex Corporation: *See*—
Blake, William S., 4,679,714, Cl. 222-449.000.
Foster, Donald D.; and Moore, David G., 4,679,712, Cl. 222-384.000.
Reames, Stephen P., to Hewlett Packard Company. Real-time end of packet signal generator. 4,680,755, Cl. 370-85.000.
Reed, Hugh B., to Federal Cartridge Corporation. 00 buckshot shotshell. 4,679,505, Cl. 102-449.000.
Reed, Joel G.: *See*—
Landry, Richard E.; and Reed, Joel G., 4,679,623, Cl. 165-166.000.
Reed, Phillip G.: *See*—
Baerenwald, Philip M.; and Reed, Phillip G., 4,680,019, Cl. 446-378.000.
Regie Nationale des Usines Renault: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,679,988, Cl. 417-218.000.
Regla, Juan; and Lazaro, Jose, to AMP Incorporated. Electrical connector and an electrical terminal. 4,679,876, Cl. 439-426.000.
Rehm, Roger P., to Singer Products Corporation. Apparatus to effect stress-free transportation of a ribbon on a conveyor capable of negotiating turns. 4,679,687, Cl. 198-778.000.
Reichley, Fred J.: *See*—
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., 4,680,202, Cl. 427-389.900.
Reid, Dwight K.: *See*—
Forester, David R.; and Reid, Dwight K., 4,680,421, Cl. 585-648.000.
Rein, Harold, to Harold Rein. Problem solving game. 4,679,796, Cl. 273-236.000.
Reiner, Roland; and Weiss, Urs, to Hoffmann-La Roche Inc. Acyl derivatives. 4,680,408, Cl. 548-100.000.
Reinke, Ronald E.: *See*—
Devall, Jeffrey E.; and Reinke, Ronald E., 4,679,580, Cl. 137-39.000.
Reliance Comm/Tec Corporation: *See*—
Bonnesen, John S.; and Sporer, Timothy J., 4,680,665, Cl. 361-120.000.
Remeha Fabrieken B.V.: *See*—
Krans, Peter; and Meuleman, Hermanus J., 4,679,528, Cl. 122-367.00C.
Remmel, Jochen; and Buchinger, Robert, to Diehl GmbH & Co. Elastic rubber bearing with hydraulic damping. 4,679,776, Cl. 267-140.100.
Renaut, Paul W.: *See*—
Hanlon, James T.; and Renaut, Paul W., 4,680,563, Cl. 335-58.000.
Rendoll Paper Company: *See*—
Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., 4,679,694, Cl. 206-611.000.
Replogle, Coy E.: *See*—
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Research Development Corporation of Japan: *See*—
Barsony, Istvan, 4,679,307, Cl. 29-576.00B.
Reuveny, Shaul: *See*—
Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, 4,680,267, Cl. 435-289.000.
Revell, Alan E., to Allis-Chalmers Corporation. Self-contained dust collector with quick release adapter duct. 4,680,039, Cl. 55-341.00R.
Rexcel, Inc.: *See*—
Malsbury, Charles R.; and Lawrence, Richard R., 4,679,699, Cl. 220-307.000.
Rey, Antoine; and Stemmler, Herbert, to BBC Brown, Boveri & Company, Limited. Method for attenuating at least one electric harmonic of the system frequency in a multi-phase alternating-current system. 4,680,531, Cl. 323-206.000.
Reynolds Metals Company: *See*—
Brunner, Hans A.; and Vaughan, Donald E., 4,680,073, Cl. 156-250.000.
Reynolds, Richard W.: *See*—
Baits, Stephen S.; and Reynolds, Richard W., 4,679,462, Cl. 74-687.000.
Rhoades, Jeffrey S.: *See*—
Kenney, Michael T.; and Rhoades, Jeffrey S., 4,680,237, Cl. 428-520.000.
Rhodes, Christopher C.: *See*—
Massie, Mark A.; and Rhodes, Christopher C., 4,679,928, Cl. 355-3.0DD.
Rhone-Poulenc Sante: *See*—
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,680,303, Cl. 514-336.000.

Rhone-Poulenc Specialties Chimiques: *See*—
Coquard, Jean; and Goletto, Jean, 4,680,379, Cl. 528-336.000.
Riat, Henri: *See*—
Seitz, Karl; Riat, Henri; and Hoegerle, Karl, 4,680,384, Cl. 534-622.000.
Richards, Peter S. Connector assembly for securing cables, pipes, or the like to a support structure. 4,679,754, Cl. 248-68.100.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
Richter, Gunter; and Froschle, Reinhard, to Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co. Method and apparatus for displacing a honing tool. 4,679,357, Cl. 51-281.00P.
Richter, Wilfried: *See*—
Klein, Karl-Heinz; and Richter, Wilfried, 4,680,774, Cl. 375-26.000.
Ricoh Co., Ltd.: *See*—
Imamura, Masanaga; and Mizuno, Isao, 4,680,592, Cl. 346-1.100.
Inokuchi, Toshiyuki, 4,679,902, Cl. 350-167.000.
Kobayashi, Mikio, 4,680,487, Cl. 307-475.000.
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, 4,680,235, Cl. 428-414.400.
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Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Rieben, Stuart L.; and Wylie, Mark E., to Westinghouse Electric Corp. Apparatus for applying an end plug to an end of a fuel rod tube. 4,679,377, Cl. 53-327.000.
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, to Beringer-Hydraulik GmbH. Pilot operated relief valve. 4,679,586, Cl. 137-491.000.
Riefling, Bernhard: *See*—
Irmscher, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, 4,680,288, Cl. 514-63.000.
Rieter-Scragg Limited: *See*—
Naylor, Geoffrey; and Lawrence, Christopher J., 4,679,284, Cl. 28-272.000.
Riikonen, Heikki, to Tunturipyora Oy. Wheelchair. 4,679,816, Cl. 280-650.000.
Riley, Patrick J., to Rockwell International Corporation. Positive feed drill clamp system. 4,679,969, Cl. 408-87.000.
Rios, Pedro A., to General Electric Company. MR magnet wiring harness circuit. 4,680,666, Cl. 361-141.000.
Rioux, Brian A., to Northern Telecom Limited. High temperature furnace for integrated circuit manufacture. 4,680,008, Cl. 432-72.000.
Ritt, Remy P. C.: *See*—
Guibert, Alain J. E.; Mestre, Roland R.; and Ritt, Remy P. C., 4,679,981, Cl. 415-116.000.
Roach, Donald J., to Hercules Incorporated. Use of desiccant to control edge fusion in dry film photoresist. 4,680,248, Cl. 430-270.000.
Roberge, James K., to Aetna Telecommunications Laboratories. Real time network receiver system fast settling amplifier. 4,680,554, Cl. 330-260.000.
Robert B. Cannon, Inc.: *See*—
Cannon, Robert B., 4,679,622, Cl. 165-154.000.
Robert Bosch GmbH: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,679,537, Cl. 123-447.000.
Haberland, Siegfried, 4,679,993, Cl. 417-490.000.
Klein, Karl-Heinz; and Richter, Wilfried, 4,680,774, Cl. 375-26.000.
van Zanten, Anton; Heess, Gerhard; and Geering, Hans P., 4,679,866, Cl. 303-104.000.
Roberts, Michael, to Pilkington P.E. Limited. Infra-red lenses. 4,679,891, Cl. 350-1.300.
Robertshaw Controls Company: *See*—
Geary, Frederick J., 4,680,005, Cl. 431-46.000.
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84.000.
Robertson Engineering (Thame) Limited: *See*—
Wauchope, Stirling G.; and McLean, Malcolm J., 4,679,471, Cl. 82-12.000.
Robertson, John A., to Telesis Controls Corporation. Code reader. 4,680,457, Cl. 235-470.000.
Robertson, John M., deceased: *See*—
Haisma, Jan; van der Werf, Pieter; Robertson, John M., deceased; and de Haan, Freidrich J., administrator, 4,679,892, Cl. 350-96.120.
Robin, Jacques: *See*—
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.
Robins, Roland K., to Viratek, Inc. Treatment of malignant tumors with 2-(β-D-ribofuranosylthiazole-4-carboxamide related compounds. 4,680,285, Cl. 514-23.000.
Roblin, Jean-Paul: *See*—
Rodriguez, Francis; and Roblin, Jean-Paul, 4,679,824, Cl. 285-27.000.
Rochefort, Malcolm P.; and Wood, Richard, to Imperial Chemical Industries PLC. Method of producing shaped articles having a simulated marble appearance. 4,680,155, Cl. 264-73.000.
Rockwell International Corporation: *See*—
Fechalos, William A., 4,680,754, Cl. 370-85.000.
Riley, Patrick J., 4,679,969, Cl. 408-87.000.
Stetson, Scott B., 4,680,489, Cl. 307-493.000.
White, Stanley A., 4,680,727, Cl. 364-754.000.
Rodger, Ian Gordon: *See*—
Ellis, Leslie G., 4,679,742, Cl. 241-266.000.
Rodgers, Robert E. Universal exercise machine. 4,679,786, Cl. 272-70.000.
Rodriguez, Francis; and Roblin, Jean-Paul, to Alsthom. Fluid-tight coupling for two sections of a fluid line. 4,679,824, Cl. 285-27.000.
Rodriguez, Marco E.: *See*—
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.
Roelofs, Darrell D.: *See*—
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.
Roggero, Arnaldo, to Enichem Elastomeri S.p.A. Certain alkali metal bis-phenethyl or tris-phenethyl-pyridines useful as multifunctional anionic initiators. 4,680,407, Cl. 546-348.000.
Rohm GmbH: *See*—
Liebler, Ralf; and Albrecht, Klaus, 4,680,359, Cl. 526-309.000.
Rohr, Wolfgang: *See*—
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,680,412, Cl. 548-480.000.
Roller, Robert A.; and Roller, Warren L. Optical viewing apparatus with two mirrors consecutively reflecting the line of sight. 4,679,916, Cl. 350-623.000.
Roller, Warren L.: *See*—
Roller, Robert A.; and Roller, Warren L., 4,679,916, Cl. 350-623.000.
Rolls-Royce plc: *See*—
Taylor, Maurice I., 4,679,394, Cl. 60-224.000.
Woodward, Clifford S., 4,679,732, Cl. 239-265.350.
Romeo, Arthur L.: *See*—
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.
Romer Labs, Inc.: *See*—
Romer, Thomas R., 4,679,737, Cl. 241-29.000.
Romer, Thomas R., to Romer Labs, Inc. Grinding sub-sampling mill and method for preparation of test sample. 4,679,737, Cl. 241-29.000.
Romox Incorporated: *See*—
Izumi, Hideki D.; and Terrell, Paul J., 4,680,731, Cl. 364-900.000.
Rones, Harvey C. Eye and binocular vision demonstrator. 4,680,015, Cl. 434-271.000.
Roquemore, William M.: *See*—
Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., 4,679,934, Cl. 356-43.000.
Roquette Freres: *See*—
Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, 4,680,180, Cl. 426-16.000.
Rosen, Perry: *See*—
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,680,415, Cl. 549-214.000.
Rosenberg, H. James, to Erie Scientific Company. Microscope slide with top and bottom marking surfaces. 4,679,914, Cl. 350-534.000.
Rosencwaig, Allan; and Opsal, Jon, to Therma-Wave, Inc. Evaluating both thickness and compositional variables in a thin film sample. 4,679,946, Cl. 374-5.000.
Rosendal, Carsten. Blanking impact absorber. 4,679,664, Cl. 188-134.000.
Rosenfeld, Jerold C.; and Pawlak, Joseph A., to Celanese Corporation. Preparation of aromatic polyester with improved stability by addition of phosphite during preparation. 4,680,371, Cl. 528-179.000.
Rosenfeld, Jerold C., to Celanese Corporation. In-situ end-capping melt prepared aromatic polyester with phenyl benzoate. 4,680,372, Cl. 528-179.000.
Ross, John J. Freestanding luminaire having floor-supported frame integrated with light fixture. 4,680,677, Cl. 362-33.000.
Ross, Milton I. Encapsulated electronic circuit device, and method and apparatus for making same. 4,680,617, Cl. 357-72.000.
Roszel, Lynn; and Tabor, Jim, to Prescolite, Inc. Dimmer circuit with input voltage compensated soft start circuit. 4,680,536, Cl. 323-321.000.
Rottmayr, Hans: *See*—
Artzt, Peter; Rottmayr, Hans; and Bauer, Wolfgang, 4,679,388, Cl. 57-263.000.
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., to Caterpillar Inc. Mounting frame for linear impact ripper assembly. 4,679,857, Cl. 299-37.000.
Rowan, Timothy M.: *See*—
Kerkman, Russel J.; and Rowan, Timothy M., 4,680,695, Cl. 363-160.000.
Roy, Wolfgang: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Royal Champignon: *See*—
Agulhon, Claude, 4,680,188, Cl. 426-281.000.
Royal College of Surgeons of England, The: *See*—
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.
Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., to United States of America, Interior. Method and apparatus for steady-state measurement of liquid conductivity in porous media. 4,679,422, Cl. 73-38.000.

Rucki, William M., to General Electric Company. Load control circuit. 4,680,508, Cl. 315-166.000.
Ruco Equipment Company, Inc.: *See*—
Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boiti, Franco, 4,679,653, Cl. 182-2.000.
Rudd, Norman. Treatment of porous structures. 4,679,380, Cl. 53-440.000.
Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, to Diehl GmbH & Co. Detonator securing device. 4,679,503, Cl. 102-208.000.
Rudolf, Felix, to Centre Electronique Horloger SA. Torsion type magnetic field measurement device. 4,680,544, Cl. 324-259.000.
Ruffner, Bryan J. Appliance anti-theft circuitry. 4,680,574, Cl. 340-571.000.
Ruhle, James L. Method and apparatus for coring rock. 4,679,636, Cl. 175-58.000.
Russin, Leonid P. Oscillator reciprocation control system for piston motor. 4,679,490, Cl. 91-189.00R.
Ryan, James M.; and Gilmore, Arthur H., to Falcon Jet Corporation. Auxiliary airplane seats. 4,679,749, Cl. 244-122.00R.
S. C. Johnson & Son, Inc.: *See*—
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., 4,680,202, Cl. 427-389.900.
Crapser, James R.; and Malek, Edward J., 4,679,713, Cl. 222-402.130.
S. Franzen Sohne GmbH & Co.: *See*—
Dueringer, Rudi, 4,679,833, Cl. 292-113.000.
S.I.E., Inc.: *See*—
Kalb, Gerald F.; and Brown, David M., 4,679,669, Cl. 188-375.000.
S.N.E.C.M.A.: *See*—
Guibert, Alain J. E.; Mestre, Roland R.; and Ritt, Remy P. C., 4,679,981, Cl. 415-116.000.
Saad, Michael. Lettering template. 4,679,328, Cl. 33-447.000.
Sackner, Marvin A., to Key Pharmaceuticals, Inc. Method and apparatus for intrapulmonary delivery of heparin. 4,679,555, Cl. 128-203.150.
Sadre, Ahmad: *See*—
Chand, Sujeet; and Sadre, Ahmad, 4,680,519, Cl. 318-568.000.
Sagara, Hiroshi: *See*—
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.
Sagoi, Masayuki; and Nishikawa, Reiji, to Kabushiki Kaisha Toshiba. Method of manufacturing perpendicular magnetic recording floppy disk. 4,680,197, Cl. 427-129.000.
Saha, Debabrata, to University of Michigan, The. Quadrature-quadrature phase shift keying. 4,680,777, Cl. 375-53.000.
Sahni, Atam P.: *See*—
Williams, Charles F.; and Sahni, Atam P., 4,680,139, Cl. 252-511.000.
Saijo, Eiji; and Wakata, Shigekazu, to Tokai Electric Wire Company Limited. Connector housing. 4,679,874, Cl. 439-595.000.
St. Clair, John S.; and Brignall, Nicolas L., to Ferranti plc. Radiation path axis directing system. 4,680,522, Cl. 318-664.000.
St. Laurent, James C. T. B.: *See*—
Busch, Alfred; and St. Laurent, James C. T. B., 4,680,131, Cl. 252-102.000.
Saito, Gunji: *See*—
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.
Saito, Hitoshi: *See*—
Inou, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, 4,680,688, Cl. 363-21.000.
Saito, Mitsuru: *See*—
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.
Saito, Sadayuki: *See*—
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.
Saito, Takashi: *See*—
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.
Sakaguchi, Masaaki: *See*—
Chikamasa, Hiroshi; and Sakaguchi, Masaaki, 4,679,744, Cl. 242-67.30R.
Sakai, Takami, to Kabushiki Kaisha Toshiba. Control apparatus of AC/DC power converter. 4,680,692, Cl. 363-35.000.
Sakai, Yasuo; and Hirata, Miyoshi, to Daiichi Pure Chemicals Co., Ltd. Particles for inhibiting non-specific immunoreaction. 4,680,274, Cl. 436-512.000.
Sakai, Yasushi: *See*—
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.
Sakakibara, Shinsuke: *See*—
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, 4,680,520, Cl. 318-594.000.
Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B.V. System for engaging an electromagnetic clutch upon acceleration of an engine. 4,679,674, Cl. 192-0.052.
Sakakiyama, Ryuzo; and Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for controlling an electromagnetic clutch for a vehicle. 4,680,712, Cl. 364-424.100.
Sakamoto, Keiji: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,680,518, Cl. 318-561.000.
Sakamoto, Tamaki, to Omron Tateisi Electronics Co. Electronic thermometer. 4,679,949, Cl. 374-183.000.
Sako, Yoichiro: *See*—
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.
Sakurai, Yutaka: *See*—
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.
Salomatina, Irina S.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.
Salomon S.A.: *See*—
Pascal, Roger; and Dimier, Jean P., 4,679,815, Cl. 280-618.000.
Salsgiver, James A.: *See*—
Shen, Tien-Hung; and Salsgiver, James A., 4,680,062, Cl. 148-111.000.
Salzmann, Thomas N.: *See*—
Christensen, Burton G.; Salzmann, Thomas N.; and Heck, James V., 4,680,292, Cl. 514-210.000.
Sameca SA: *See*—
Geiser, Markus; and Vandevoir, Claude, 4,679,470, Cl. 82-2.700.
Sampson, Samuel O., Jr. Wheel chair table system. 4,679,509, Cl. 108-27.000.
Samuelsson, Bjorn. Surface-forming panel. 4,679,370, Cl. 52-407.000.
Sanada, Kazuo: *See*—
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.
Sanden Corporation: *See*—
Tamura, Yasuji, 4,680,492, Cl. 310-15.000.
Yanagisawa, Masahiro, 4,679,829, Cl. 285-190.000.
Sanders, Robert K., to General Motors Corporation. Solenoid valve. 4,679,593, Cl. 137-625.650.
Sanders, Winfred J.: *See*—
Menon, Govind K.; and Sanders, Winfred J., 4,680,304, Cl. 514-340.000.
Sandhu, Jaswinder S., to Raj Technology, Inc. Reciprocating method and apparatus for producing uniform ultrasonic field for use in liquid crystal based acoustical imaging. 4,679,436, Cl. 73-603.000.
Sandoz Ltd.: *See*—
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.
Sannes, Tjerk: *See*—
Bailleul, Gilles; and Sannes, Tjerk, 4,679,317, Cl. 29-828.000.
Sanraku-Ocean Co., Ltd.: *See*—
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.
Santel, Hans-Joachim: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
Santhouse, Daniel: *See*—
Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.
Sanyo Electric Co., Ltd.: *See*—
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.
Yagi, Katsumi, 4,680,768, Cl. 372-45.000.
Saotome, Shigeru: *See*—
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Riding type mower. 4,679,382, Cl. 56-10.100.
Saruwatari, Kazuyuki: *See*—
Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, 4,680,116, Cl. 210-282.000.
Sasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Ultrasonic diagnostic apparatus using non-linear parameters of an organ. 4,679,565, Cl. 128-660.000.
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, to Hitachi, Ltd. Method and apparatus of determining an attitude of a satellite. 4,680,718, Cl. 364-455.000.
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased (by Satomi, Fumiko, legal representative), to Hitachi, Ltd. Apparatus for checking patterns on printed circuit boards. 4,680,627, Cl. 358-101.000.
Sato, Hideaki; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,680,257, Cl. 430-614.000.
Sato, Hideo, to Sony Corporation. Printed circuit board terminal device. 4,680,675, Cl. 361-397.000.
Sato, Keiichi: *See*—
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.
Sato, Kiyoshi: *See*—
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.

Sato, Shigeru; and Ozawa, Takashi, to Fuji Xerox Co. Ltd. Contact type document reading device with uniform line-to-line conductor capacitance. 4,680,477, Cl. 250-578.000.

Sato, Toshifumi: *See*—
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, to Canon Kabushiki Kaisha. Vari-focal objective lens of short total length. 4,679,913, Cl. 350-423.000.

Sato, Yoshinori: *See*—
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.

Satoh, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotoshi, to Nippon Paint Co., Ltd. Epoxy resinous varnish its preparation and coating composition containing the same. 4,680,348, Cl. 525-528.000.

Satoh, Shinichi: *See*—
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Satomi, Fumiko, legal representative: *See*—
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Satomi, Yoshikatsu, deceased: *See*—
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Saunders, Chris H., to TRW Inc. Wired-AND FET logic gate. 4,680,484, Cl. 307-448.000.

Sayles, Delbert E., Sr. Silver sensing material for use on film. 4,680,138, Cl. 252-503.000.

Scaife, Stephen: *See*—
Bank, Graham; Scaife, Stephen; and Millward, Gareth, 4,680,800, Cl. 381-194.000.

Scanlon, John F.: *See*—
Nelson, Jeffrey D.; and Scanlon, John F., 4,679,485, Cl. 89-36.020.

Scelba, Stephen S., to Presto Lock, Inc. Front-programmable combination lock with movable faceplate. 4,679,419, Cl. 70-312.000.

Schachter, Friedrich. Lighter with adjustable flame. 4,680,007, Cl. 431-344.000.

Schappert, Raymond F.: *See*—
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Scharnowski, Gerhard: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

Schatzler, Walter: *See*—
Lux, Horst; and Schatzler, Walter, 4,679,846, Cl. 296-214.000.

Scheck, Michael: *See*—
Bastanzuri, Remberto P., 4,680,088, Cl. 162-4.000.

Scheer, Martin: *See*—
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.

Scheff, Luben: *See*—
Pupillo, Dominic S.; and Scheff, Luben, 4,679,836, Cl. 292-216.000.

Scheffer, Daniel G.: *See*—
Brock, Marilyn A.; and Scheffer, Daniel G., 4,679,642, Cl. 177-164.000.

Schegolev, Viktor A.: *See*—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Schenck, John F.: *See*—
Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.

Schenke, Reynold A.: *See*—
Schenke, Robert W.; and Schenke, Reynold A., 4,680,683, Cl. 362-190.000.

Schenke, Robert W.; and Schenke, Reynold A. Battery and bulb conversion cartridge for self-feeding candle holder. 4,680,683, Cl. 362-190.000.

Scherer, William C.: *See*—
Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Schering Corporation: *See*—
Blythin, David J.; and Watkins, Robert W., 4,680,297, Cl. 514-293.000.
Blythin, David J., 4,680,298, Cl. 514-293.000.

Scheydecker, Jacques: *See*—
Helffer, Bernard; and Scheydecker, Jacques, 4,679,785, Cl. 271-227.000.

Schieber, Hans; and Geitner, Otto, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Method for determining and correcting the length of a piece of knitting produced on a flat knitting machine. 4,679,412, Cl. 66-71.000.

Schierjott, Rudolf: *See*—
Stasch, Harald; and Schierjott, Rudolf, 4,680,687, Cl. 363-18.000.

Schlatter, Gerald L.: *See*—
Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., 4,679,947, Cl. 374-42.000.

Schlusener, Horst: *See*—
Merten, Gerhard; Rafael, Werner; and Schlusener, Horst, 4,679,429, Cl. 73-168.000.

Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., to Shell Oil Company. Robotic stapling system for fiber placement for composite parts. 4,679,291, Cl. 29-432.000.

Schmid, Alfred, to Bucher-Guyer AG. Method and an apparatus for accelerating air or gas exchange. 4,679,601, Cl. 141-4.000.

Schmidt, Ingo: *See*—
Hinzpeter, Jurgen; and Schmidt, Ingo, 4,680,158, Cl. 264-40.500.

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Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.

Schmiechen, Rolf: *See*—
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.

Schmiedberg, Winfried F.: *See*—
Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., 4,680,010, Cl. 432-148.000.

Schmitt-Landsiedel, Doris; and Dorda, Gerhard, to Siemens Aktiengesellschaft. Integrated JK-flipflop circuit including hot-electron transistors. 4,680,481, Cl. 307-279.000.

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Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., 4,680,346, Cl. 525-486.000.

Schmitz, Walter; and Koch, Jurgen, to Licentia Patent-Verwaltungs-GmbH. Method for producing a carrier material for the solar cells of a solar generator. 4,680,074, Cl. 156-291.000.

Schnabl, Rudolf: *See*—
Witting, Karin; Poss, Dieter; and Schnabl, Rudolf, 4,680,438, Cl. 200-268.000.

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Hovinga, Donald G., 4,679,715, Cl. 222-517.000.

Schneider, Richard: *See*—
Manzke, Klaus; Schneider, Richard; and Kohl, Lambert, 4,680,656, Cl. 360-98.000.

Schober, Konrad: *See*—
Hieber, Konrad; Neppl, Franz; and Schober, Konrad, 4,680,612, Cl. 357-71.000.

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Clasen, Rolf; and Scholz, Heinz, 4,680,047, Cl. 65-17.000.

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Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.

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Artzt, Peter; Rottmayr, Hans; and Bauer, Wolfgang, 4,679,388, Cl. 57-263.000.

Schubert, Thomas F.: *See*—
Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.

Schufer, Dieter, to Leifheit AG. Folding hand truck. 4,679,817, Cl. 280-655.000.

Schulte, Klaus; and Ersfeld, Heinrich, to Bayer Aktiengesellschaft. Apparatus for the production of moldings from flowable reactive components. 4,680,003, Cl. 425-206.000.

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Guntly, Thomas G.; and Schultz, Curtis L., 4,679,534, Cl. 123-187.50R.

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Schulz, Wolfgang: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,679,537, Cl. 123-447.000.

Schulze, Ernst: *See*—
Irmscher, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, 4,680,288, Cl. 514-63.000.

Schumacher, Robert W.; and Houston, Mary B., to Warner-Lambert Company. Ingestible, high density, compressed-tablet fiber-composition. 4,680,189, Cl. 426-285.000.

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Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.

Schutz, Ronald J.: *See*—
Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., 4,680,084, Cl. 156-626.000.

Schwaab, Konstantin, to Union Special Corporation. Presser foot with slidable plunger. 4,679,514, Cl. 112-235.000.

Schwalbach, Manfred: *See*—
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Schwartz, Paul; Gill, Devinder S.; and McGrath, Kenneth J., to Andrulis Research Corporation. Stable soluble 1,2-diaminocyclohexane platinum complexes. 4,680,308, Cl. 514-492.000.

Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., to United Kingdom Atomic

Energy Authority. Ultrasonic liquid interface detector. 4,679,430, Cl. 73-290.00V.

Scott, Melvin: *See—*
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,680,143, Cl. 252-553.000.

Scott, Warner C., to Texas Instruments Incorporated. Method and apparatus for recognition of discontinuous text. 4,680,805, Cl. 382-22.000.

Seahorse Equipment Corporation: *See—*
Blandford, Joseph W., 4,679,964, Cl. 405-216.000.

Sealed Air Corporation: *See—*
Malwitz, Nelson E., 4,680,324, Cl. 524-58.000.

Seco Tools AB: *See—*
Andersson, Kjell, 4,679,972, Cl. 408-150.000.

Sedam, Jason K., to Coca-Cola Company, The. Post-mix beverage dispenser apparatus having front access for loading syrup, CO_2 and water. 4,679,707, Cl. 222-129.100.

Seddon, Alan E.; and Doughty, John, to BICC Public Limited Company. Overhead electric traction system for railways. 4,679,672, Cl. 191-41.000.

Sedlak, Adlof; and Stotz, Gerhard, to Timex Corporation. Electric watch. 4,679,944, Cl. 368-157.000.

Sedrick, A. Victor, Jr.; and Lowell, Charles R., to Hollis Automation, Inc. Mass soldering system providing a sweeping fluid blast. 4,679,720, Cl. 228-20.000.

Seebacher, Gerald: *See—*
Lubojatsky, Walter; Lachner, Hans; and Seebacher, Gerald, 4,679,856, Cl. 299-11.000.

Seiber, Brian L.: *See—*
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.

Seiden, Paul; and Mishkin, Martin A., to Procter & Gamble Company, The. Emulsifier formulation for cookies. 4,680,184, Cl. 426-654.000.

Seidler, Jack, to North American Specialties Corporation. Solder-bearing leads. 4,679,889, Cl. 439-876.000.

Seiko Epson Kabushiki Kaisha: *See—*
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.
Osafune, Haruo; Kanbe, Sadao; Mori, Teiichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.

Seiner, Jerome A.: *See—*
Das, Suryya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Seito, Shinichi: *See—*
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Seitz, Karl; Riat, Henri; and Hoegerle, Karl, to Ciba-Geigy Corporation. Dyes, their preparation and use. 4,680,384, Cl. 534-622.000.

Seki, Masaki: *See—*
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,680,719, Cl. 364-474.000.

Semedard, Jean-Claude: *See—*
Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, 4,679,755, Cl. 248-74.100.

Senco Products, Inc.: *See—*
Kramer, Francis J., 4,679,719, Cl. 227-5.000.

Seneker, Carl A.: *See—*
Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., 4,680,346, Cl. 525-486.000.

Sengupta, Sisir K., to Boston University, Trustees of. Analogues of actinomycin D. 4,680,382, Cl. 530-317.000.

Seno, Eugene T.: *See—*
Birmingham, Virginia A.; and Seno, Eugene T., 4,680,265, Cl. 435-172.300.

Senso, Hitoshi, to Pioneer Electronic Corporation. Recording disc rotary drive control apparatus. 4,680,746, Cl. 369-50.000.

Servaux, Jean: *See—*
Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, 4,679,701, Cl. 220-404.000.

Sessions, Robert W. Monitoring electrode attachable to a patient. 4,679,564, Cl. 128-640.000.

Seybold, Rolf: *See—*
Evertz, Egon; and Seybold, Rolf, 4,679,355, Cl. 51-99.000.

Shaffer, David T.: *See—*
Corrao, Mark; and Shaffer, David T., 4,680,568, Cl. 337-186.000.

Shah, Dipika R.: *See—*
Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., 4,680,040, Cl. 55-387.000.

Shannon, Timothy L. Paint scraper. 4,679,275, Cl. 15-236.00R.

Sharma, Ram A., to General Motors Corporation. Metallothermic reduction of rare earth chlorides. 4,680,055, Cl. 75-84.500.

Sharma, Satish C., to GenCorp Inc. Adhesion of rubber to aramid cords. 4,680,228, Cl. 428-378.000.

Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, 4,680,505, Cl. 313-558.000.
Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, 4,679,909, Cl. 350-333.000.
Takeda, Yoshio, 4,680,226, Cl. 428-327.000.

Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, 4,679,414, Cl. 68-12.00R.

Sheehan, Neil J.; Oppenlander, Jon E.; and Fleenor, Richard P., to Baxter Travenol Laboratories, Inc. Multi-volume displacement pipette. 4,679,446, Cl. 73-864.130.

Sheehan, Robert Douglas: *See—*
Quintel, Francis W., 4,679,383, Cl. 56-13.400.

Sheehy, Roger C.; and Muskat, Irwin, to Granite State Packing Company, Inc. Portion controlled sliced fresh whole muscle meat product. 4,680,186, Cl. 426-129.000.

Sheehy, Roger C.; and Muskat, Irwin, to Granite State Packing Company, Inc. Portion controlled sliced cooked whole muscle meat product. 4,680,187, Cl. 426-129.000.

Shell Oil Company: *See—*
Goodall, Brian L.; and Grothenhuis, Paulus A. M., 4,680,168, Cl. 423-22.000.
Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., 4,679,291, Cl. 29-432.000.

Shell, William. Visualization of a bloodstream circulation with biodegradable microspheres. 4,680,171, Cl. 424-5.000.

Shen, Tien-Hung; and Salsgiver, James A., to Allegheny Ludlum Corporation. Method for reducing core losses of grain-oriented silicon steel using liquid jet scribing. 4,680,062, Cl. 148-111.000.

Sherin, Alan; Geagley, Bradley; and Benest, Glenn. Board game simulating travel through time. 4,679,797, Cl. 273-251.000.

Sherwood Medical Company: *See—*
Ranford, Alan B.; and Fecht, David C., 4,680,029, Cl. 604-280.000.

Sherwood Tool, Incorporated: *See—*
Varano, Richard F., 4,680,023, Cl. 493-75.000.

Shibahara, Yoshihiko; and Ikoma, Hideto, to Fuji Photo Film Co., Ltd. Color photographic material. 4,680,253, Cl. 430-504.000.

Shibata, Akira, to Chugai Denki Kogyo K.K. Method for preparing Ag-SnO system alloy electrical contact material. 4,680,162, Cl. 419-21.000.

Shibata, Yoji, to Shin Nihon Koku Seibi Co., Ltd. Full length interlocking hinge for a folding door. 4,679,277, Cl. 16-354.000.

Shibuya, Kazunori, to Victor Company of Japan, Ltd. Lid locking mechanism for an automatic tape cassette loading and unloading apparatus. 4,680,654, Cl. 360-96.500.

Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. Pesticidal novel nitromethylene derivatives. 4,680,294, Cl. 514-256.000.

Shiley Inc.: *See—*
Lubock, Paul; and Sullivan, Mike, 4,679,556, Cl. 128-303.00R.

Shilton, Brian: *See—*
Ulrich, Helmut; Bartscher, Peter; and Shilton, Brian, 4,679,865, Cl. 303-52.000.

Shimada, Kazuaki: *See—*
Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, 4,680,116, Cl. 210-282.000.

Shimano, Noriyuki; Tokura, Isao; and Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Picture scanning and recording method with selection between two differently processed signals. 4,680,642, Cl. 358-280.000.

Shimazaki, Tatsuo: *See—*
Sugiyama, Kazuhiro; and Shimazaki, Tatsuo, 4,680,724, Cl. 364-708.000.

Shimizu, Junzoh, to NEC Corporation. Self-aligned process for forming dielectrically isolating regions formed in semiconductor device. 4,679,306, Cl. 29-576.00W.

Shimizu, Masami: *See—*
Suzuki, Nobuyuki; and Shimizu, Masami, 4,679,926, Cl. 354-173.110.

Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, to Hitachi, Ltd.; and Dainichiseika Color & Chemicals MFG. Co., Ltd. White ink composition for ink-jet printing. 4,680,058, Cl. 106-23.000.

Shimizu, Toshio: *See—*
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.

Shimizu, Yasumasa: *See—*
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

Shimkunas, Alexander R.; and Block, Barry, to Micronix Corporation. Method for producing a mask for use in X-ray photolithography and resulting structure. 4,680,243, Cl. 430-5.000.

Shimoe, Toshio: *See—*
Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, 4,680,758, Cl. 370-110.200.

Shin-Etsu Chemical Co., Ltd.: *See—*
Tanaka, Masaki; and Ichinohe, Shoji, 4,680,366, Cl. 528-27.000.

Shin Nihon Koku Seibi Co., Ltd.: *See—*
Shibata, Yoji, 4,679,277, Cl. 16-354.000.

Shin Nisso Kako Co., Ltd.: *See—*
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Shinoda, Takashi: *See—*
Oishi, Kanji; and Shinoda, Takashi, 4,680,737, Cl. 365-222.000.

Shinohara, Haruo: *See—*
Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, 4,679,860, Cl. 301-9.0DN.

Shinohara, Satoshi: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Ta-

keya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Shinomura, Ryuichi: *See—*
Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.

Shiozaki, Tomoharu: *See—*
Okamoto, Shigeo; and Shiozaki, Tomoharu, 4,680,597, Cl. 503-214.000.

Shirai, Noboru: *See—*
Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami, 4,679,861, Cl. 301-37.00P.

Shirai, Tadao, to Nec Corporation. Microwave waveguide filter having a metal plate which includes a resonant aperture therein. 4,680,561, Cl. 333-208.000.

Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, to Erma Optical Works, Ltd.; and Ulvac Service Corporation. Apparatus for measuring impurities in super-pure water without exposure to surrounding atmosphere. 4,680,552, Cl. 324-439.000.

Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, to Canon Kabushiki Kaisha. Method and apparatus for reading an image. 4,680,644, Cl. 358-294.000.

Shirey, Richard, to Donn Incorporated. Suspension ceiling grid system with narrow-faced grid. 4,679,375, Cl. 52-777.000.

Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for multicolor image forming. 4,680,625, Cl. 358-80.000.

Shoji, Hisashi: *See—*
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,679,929, Cl. 355-4.000.

Shojima, Hiroshi: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.

Shu, Nan-Chiang, to International Business Machines Corporation. Automatic data restructurer. 4,680,705, Cl. 364-300.000.

Shuler, Jerry N. Bicycle rear suspension system. 4,679,811, Cl. 280-284.000.

Siegen Corporation: *See—*
Blau, David A.; and Fish, William R., 4,679,568, Cl. 128-696.000.

Siemens Aktiengesellschaft: *See—*
Flach, Werner, 4,680,431, Cl. 178-69.00R.
Hartkopf, Hans-Otto; and Zeller, Christoph, 4,680,809, Cl. 455-601.000.
Henneberger, Hans, 4,680,799, Cl. 381-68.600.
Hieber, Konrad; Neppl, Franz; and Schober, Konrad, 4,680,612, Cl. 357-71.000.
Jahnke, Andreas, 4,680,565, Cl. 335-216.000.
Krause, Norbert, 4,680,550, Cl. 324-318.000.
Mitlehner, Heinz; and Kolbesen, Bernd, 4,680,601, Cl. 357-15.000.
Pammer, Erich, 4,680,610, Cl. 357-68.000.
Schmitt-Landsiedel, Doris; and Dorda, Gerhard, 4,680,481, Cl. 307-279.000.
Schrenk, Hartmut, 4,680,736, Cl. 365-218.000.
Stasch, Harald; and Schierjott, Rudolf, 4,680,687, Cl. 363-18.000.

Siemens-Allis: *See—*
May, William E.; McColloch, Rex, Jr.; and King, William A., 4,680,672, Cl. 361-353.000.

Siemens-Allis, Inc.: *See—*
DiMarco, Bernard; and Stanford, Charles W., 4,680,564, Cl. 335-16.000.

Sieradzki, Christopher; and Jeffreys, Lyman W., to Amsted Industries Incorporated. Method and apparatus for positioning and testing railroad wheels. 4,679,447, Cl. 73-865.800.

Sieradzki, Christopher Z., to AMSTED Industries Incorporated. Grinding wheel advancing apparatus. 4,679,358, Cl. 51-165.720.

Sijbers, Peter J. M.; Otten, Henricus J. M.; and Van Der Plaats, Petrie J., to U.S. Philips Corporation. Audio transmission circuit comprising a transmit amplifier in the form of a line voltage stabilizer. 4,680,789, Cl. 379-395.000.

Silvestri, Victor J.: *See—*
Beyer, Klaus D.; and Silvestri, Victor J., 4,680,614, Cl. 357-50.000.

Simanski, Edward G. Piano keyboard shield. 4,679,482, Cl. 84-467.000.

Simelunas, William J.; and Polifroni, Nicholas R., to Nabisco Brands, Inc. Apparatus for producing laminated products. 4,679,496, Cl. 99-450.200.

Simon, Jaime: *See—*
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,680,396, Cl. 344-337.000.

Simon, Reinhard: *See—*
Puhler, Alfred; Simon, Reinhard; and Priefer, Ursula, 4,680,264, Cl. 435-172.300.

Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., to Fremont Special Machine Co., Inc. Apparatus for forming and inserting cell separator baskets. 4,679,316, Cl. 29-731.000.

Simonton, Robert D.; and Breese, Douglas E., to Fremont Special Machine Company, Inc. Wrapped battery plate. 4,680,242, Cl. 429-136.000.

Simpson, Richard O.: *See—*
Hester, Phillip D.; and Simpson, Richard O., 4,680,700, Cl. 364-200.000.

Sinclair, David: *See—*
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Sindermann, Siegmar: *See—*
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,679,603, Cl. 141-39.000.

Singer Products Corporation: *See—*
Rehm, Roger P., 4,679,687, Cl. 198-778.000.

Singleton, Raymund. Electroplating apparatus. 4,680,099, Cl. 204-213.000.

Siro SpA: *See—*
Compagnucci, Rossano; and Masera, Ercole, 4,679,746, Cl. 242-77.200.

Siwinski, Paul P.: *See—*
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.

Sjolander, Johan: *See—*
Bengtsson, Lars; and Sjolander, Johan, 4,679,632, Cl. 166-345.000.

SKF GmbH: *See—*
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.

Skipka, Guido; and Durholz, Friedrich, to Bayer Aktiengesellschaft. Process for the preparation of 4,4'-dinitrostilbene-2,2'-disulphonic acid salts. 4,680,146, Cl. 260-505.00R.

Skogmo, Phillip J.; and Tucker, Tillman J., to United States of America, Energy. Explosive-driven, high speed, arcless switch. 4,680,434, Cl. 200-61.080.

Skoog, Kurt, to Stubinen Utveckling AB. Method of and apparatus for burning liquid and/or solid fuels in pulverized from. 4,679,512, Cl. 110-347.000.

Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, to Clairol Incorporated. Hairsetter system for electrically heating hair rollers. 4,680,444, Cl. 219-222.000.

Skuratovsky, Eugene: *See—*
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861.240.

Sloan-Kettering Institute for Cancer Research: *See—*
Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, 4,680,258, Cl. 435-7.000.

Small, Thomas R., to Johns Hopkins University, The. Vibration dissipation mount for motors or the like. 4,679,761, Cl. 248-609.000.

Smith, Donald F.: *See—*
Koleske, Joseph V.; Smith, Donald F.; and Weber, Robert J., 4,680,361, Cl. 526-318.000.

Smith, Donald P.; and Archer, Virgil L., to Smith, Donald P. Fanplenum configuration. 4,679,542, Cl. 126-21.00A.

Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., to Johnston Pump/General Valve, Inc. Automatic valve actuator and control system. 4,679,764, Cl. 251-14.000.

Smith, Jane E.: *See—*
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861.240.

Smith, Jay A., to Laser Magnetic Storage International Company. Apparatus for loading and unloading the leader block of a tape cartridge. 4,679,747, Cl. 242-195.000.

Smith, Roy E., to Urban Transportation Development Corporation Ltd. Brake disc design for wheel mounted discs. 4,679,665, Cl. 188-218.0XL.

Smith, Tammy L., to University of California. Method for detecting molecules containing amine or thiol groups. 4,680,272, Cl. 436-86.000.

SmithKline Beckman Corporation: *See—*
Menon, Govind K.; and Sanders, Winfred J., 4,680,304, Cl. 514-340.000.

Smiths Industries Public Limited Company: *See—*
Jacob, Neil R.; and Suiter, John R., 4,679,431, Cl. 73-290.00R.

Smolensky, Leo A.: *See—*
Holmes, Myron L.; and Smolensky, Leo A., 4,679,511, Cl. 110-216.000.

Snitzer, Elias: *See—*
Hakimi, Farhad; Po, Hong; and Snitzer, Elias, 4,680,767, Cl. 372-6.000.

Snyder Laboratories, Inc.: *See—*
Olson, Daniel H., 4,679,596, Cl. 137-853.000.

Snyder, Robert P.: *See—*
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.

Sobel, Burton E.: *See—*
Ambos, Hans D.; Cain, Michael E.; and Sobel, Burton E., 4,680,708, Cl. 364-417.000.

Sociedad Anonima de Racionalizacion y Mecanizacion (Sadrym): *See—*
Gutierrez-Rubio, Joaquin, 4,679,499, Cl. 99-591.000.

Societe a Responsabilite Limitee l'Electricfil Industrie: *See—*
Kohen, Isak, 4,680,543, Cl. 324-208.000.

Societe Anonyme Dite: *See—*
Exarque, Jean; and Camand, Michel, 4,680,775, Cl. 375-39.000.

Societe de Recherches Industrielles: *See—*
Picart, Francois, 4,680,411, Cl. 548-430.000.

Societe de Recherches Industrielles (S.O.R.I.): *See—*
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.

Societe de Verrerie et de Thermometrie: *See—*
Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., 4,680,671, Cl. 361-329.000.

Societe Generale des Eaux Minerales de Vittel: *See—*
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.

Societe Nationale d'Etude et de Construction de Moteur d'Aviation "S. N. E. C. M. A.": *See*—
Bouiller, Jean G.; and Jourdain, Gerard E. A., 4,679,982, Cl. 415-145.000.
Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S.: *See*—
Borel, Joseph, 4,679,309, Cl. 29-576.00W.
Societe Xeram: *See*—
Taverdet, Jean C., 4,680,673, Cl. 361-385.000.
Soderhold, Jan; and Cedraeus, Hugo. Package for risk samples. 4,679,688, Cl. 206-204.000.
Soffer, Bernard H.: *See*—
Efron, Uzi; and Soffer, Bernard H., 4,679,910, Cl. 350-335.000.
Sogo, Toshiyuki; and Ide, Fumito, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,679,927, Cl. 355-3.00R.
Sohio Commercial Development Co.: *See*—
Basol, Bulent M., 4,680,611, Cl. 357-71.000.
Solc, Jitka, to Dow Chemical Company, The. Method for preparing colloidal size particulate. 4,680,200, Cl. 427-213.340.
Solie, O. B.; and Pyle, Godfrey J., to Minnesota Mining and Manufacturing Company. Cushion and method. 4,679,851, Cl. 297-452.000.
Sone, Masakazu; and Nakajima, Takeshi, to Sony Corporation. Paper feeding and ejecting device for a printing apparatus. 4,679,953, Cl. 400-625.000.
Sony Corporation: *See*—
Sato, Hideo, 4,680,675, Cl. 361-397.000.
Sone, Masakazu; and Nakajima, Takeshi, 4,679,953, Cl. 400-625.000.
Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, 4,680,763, Cl. 371-37.000.
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.
Tatami, Mitsushige, 4,680,658, Cl. 360-36.200.
Wilkinson, James H., 4,680,766, Cl. 371-47.000.
Soos, Gyongyver: *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
Sorenson, Richard W., to Carlingswitch, Inc. Rocker switch for sliding or pivoting contact lever. 4,680,435, Cl. 200-68.200.
Sota, Kaoru: *See*—
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.
Southwire Company: *See*—
Chia, E. Henry; and Adams, Ronald D., 4,679,613, Cl. 164-453.000.
Spalding & Evenflo Companies, Inc.: *See*—
Melvin, Terence; and Nesbitt, R. Dennis, 4,679,795, Cl. 273-235.00R.
Spanier, Henry C.: *See*—
Spiel, Albert; and Spanier, Henry C., 4,680,190, Cl. 426-302.000.
Sparkes, Robert G.: *See*—
Agoston, Agoston; and Sparkes, Robert G., 4,680,780, Cl. 375-120.000.
Spector, George: *See*—
Hawker, Ralph L.; and Spector, George, 4,680,426, Cl. 174-57.000.
Spectra-Physics, Inc.: *See*—
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.
Speir, Donald J.: *See*—
Bryant, Stephen M.; and Speir, Donald J., 4,680,589, Cl. 342-196.000.
Spence, James F., to General Kinematics Corporation. Uniform material discharge apparatus. 4,679,708, Cl. 222-161.000.
Speraw, Floyd G., to NCR Corporation. Cable strain relief device. 4,680,425, Cl. 174-50.000.
Sperry Corporation: *See*—
Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., 4,680,759, Cl. 370-112.000.
Spiel, Albert; and Spanier, Henry C., to Nabisco Brands. Date processing method. 4,680,190, Cl. 426-302.000.
Spielau, Paul: *See*—
Kuhnel, Werner; and Spielau, Paul, 4,680,317, Cl. 521-89.000.
Spierings, Gijsbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., to U.S. Philips Corporation. Glass composition suitable for use in a fluorescent lamp and in a cathode-ray tube, fluorescent lamp and cathode-ray tube manufactured using this glass composition. 4,680,503, Cl. 313-480.000.
Spierings, Petrus A. M. Back support mechanism and method. 4,679,848, Cl. 297-284.000.
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., to Hazeltine Corporation. Color monitor with improved synchronization. 4,680,510, Cl. 315-368.000.
Sporer, Timothy J.: *See*—
Bonnesen, John S.; and Sporer, Timothy J., 4,680,665, Cl. 361-120.000.
Spraggins, Mike. Modular window insert with collapsible shade. 4,679,610, Cl. 160-107.000.
Spratt, Kenneth, to James, Thomas A. Locking mechanism for lightweight security cabinet. 4,679,415, Cl. 70-118.000.
Spykerman, Scott A., to Prince Corporation. Visor mounting clip. 4,679,843, Cl. 296-97.00K.
Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., to General Electric Company. Back projection image reconstruction apparatus and method. 4,680,709, Cl. 364-414.000.
Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Reinforcing unit for a longitudinal bearer. 4,679,820, Cl. 280-781.000.
Stadden, Richard S. Dual action geneva cam and rotary internal combustion engine and pump utilizing same. 4,679,535, Cl. 123-245.000.
Stadler, Hansjorg: *See*—
Kriz, Helmut; and Stadler, Hansjorg, 4,679,915, Cl. 350-611.000.
Stadler, Peter: *See*—
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.
Stafford, Rodney L.: *See*—
Fry, Steven A.; and Stafford, Rodney L., 4,679,840, Cl. 296-64.000.
Stage, Hermann. Process for degassing, dehydrating and precut separation in straight-run distillation of crude fatty acids. 4,680,092, Cl. 203-22.000.
Stanbery, Billy J., to Boeing Company, The. Two-terminal, thin film, tandem solar cells. 4,680,422, Cl. 136-249.000.
Standard Precision, Inc.: *See*—
Delmege, Dale; and Rask, Richard O., 4,679,950, Cl. 384-18.000.
Stanford, Charles W.: *See*—
DiMarco, Bernard; and Stanford, Charles W., 4,680,564, Cl. 335-16.000.
Stanley Electric Co., Ltd.: *See*—
Iwaki, Akihiro, 4,680,678, Cl. 362-61.000.
Iwaki, Akihiro; and Tajima, Masayoshi, 4,680,680, Cl. 362-80.000.
Stanley, Smith B.; and Alroy, Yoram A. Telescopic bed. 4,679,261, Cl. 5-183.000.
Stasch, Harald; and Schierjott, Rudolf, to Siemens Aktiengesellschaft. Switch-mode power supply having a free-running forward converter. 4,680,687, Cl. 363-18.000.
Stauffer Chemical Company: *See*—
Greco, Carl C., 4,680,350, Cl. 526-125.000.
Stedman Machine Co.: *See*—
Orphall, Axel W., 4,679,740, Cl. 241-189.00R.
Stein Industrie: *See*—
Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, 4,679,755, Cl. 248-74.100.
Stein, John, to Kim Hotstart Mfg. Co., Inc. Liquid pulsation dampening device. 4,679,597, Cl. 138-26.000.
Steinhart, Jonathan E., to Tektronix, Inc. Method and apparatus for storing and updating user entered command strings for use with otherwise unassigned softkeys. 4,680,729, Cl. 364-900.000.
Steirische Kettenfabriken Pengg-Walenta KG: *See*—
Jeindl, Ferdinand, 4,679,608, Cl. 152-213.00A.
Stemmler, Herbert: *See*—
Rey, Antoine; and Stemmler, Herbert, 4,680,531, Cl. 323-206.000.
Stephen, Adrian: *See*—
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.
Sterkin, Viktor E.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.
Stetson, Scott B., to Rockwell International Corporation. Controllable piecewise linear gain circuit. 4,680,489, Cl. 307-493.000.
Stevens, Curtis E., to Parker Hannifin Corporation. Multi-axis force controller. 4,680,465, Cl. 250-229.000.
Steward, John H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener orienting, tapping and collection system. 4,679,690, Cl. 206-345.000.
Stewart, Hubert F.: *See*—
Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., 4,679,844, Cl. 296-136.000.
Stewart, James P., to Lockheed Missiles & Space Company, Inc. Coupling mechanism. 4,679,961, Cl. 403-341.000.
Stewart, Robert E., to Litton Systems, Inc. Integrated force balanced accelerometer. 4,679,434, Cl. 73-517.00B.
Stewart Stamping Corporation: *See*—
Volk, Claus, 4,679,878, Cl. 439-425.000.
Stewart, Wesley J.: *See*—
Waltman, John H.; Stewart, Wesley J.; and Leroux, Gerald E., 4,679,543, Cl. 126-25.00R.
Stewart, William R., to Wm. R. Stewart & Sons (Hacklemakers) Limited. Opening roller assemblies for open end spinning machines. 4,679,390, Cl. 57-408.000.
Stirtz, Ronald H. Fishing flasher. 4,679,347, Cl. 43-43.100.
Stockburger, Hermann; and Winderlich, Hans-Georg. Method and device for identifying data supports. 4,680,807, Cl. 382-58.000.
Stockel, Richard F.; and Dumas, Phillip E. Use of selenium-containing compounds for negating the toxic effects of gold compounds used in the treatment of rheumatoid arthritis, and a novel selenium-containing gold compound and use thereof as an anti-rheumatoid arthritis medicine. 4,680,286, Cl. 514-23.000.
Stoll, Kurt. Limit sensing device. 4,679,452, Cl. 74-110.000.
Stora Kopparbergs Bergslags AB: *See*—
Bernhard, Ragnar, 4,680,136, Cl. 252-188.200.
Storage Technology Corporation: *See*—
Hopta, Daniel F., 4,680,480, Cl. 307-270.000.
Storbakken, George D. Vapor lock control and fuel economizer. 4,679,539, Cl. 123-557.000.
Stotz, Gerhard: *See*—
Sedlak, Adlof; and Stotz, Gerhard, 4,679,944, Cl. 368-157.000.

Stouffer Corporation, The: *See—*
Guilbault, Joseph D., 4,679,787, Cl. 272-93.000.

Straayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., to Tektronix, Inc. Multipurpose cursor control keyswitch. 4,680,577, Cl. 340-711.000.

Strader, Don S., to Goodyear Tire & Rubber Company, The. Belt testing device. 4,679,443, Cl. 73-826.000.

Stratton, Andrew: *See—*
Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, 4,680,590, Cl. 342-457.000.

Straza, George C. P.: *See—*
Straza, George T.; and Straza, George C. P., 4,679,792, Cl. 273-78.000.

Straza, George T.; and Straza, George C. P. Golf putter. 4,679,792, Cl. 273-78.000.

Strickler, Roger D., to Elliott Turbomachinery Co., Inc. Protection system for steam turbines including a superheat monitor. 4,679,399, Cl. 60-646.000.

Strom, James: *See—*
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.

Strong Plastics Limited: *See—*
Hodgson, Thomas C., 4,680,077, Cl. 156-321.000.

Strongin, Alexandr Y.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Stuart, Herbert H., to Lact-Assist, Incorporated. Flexible breast receptor for breast pump. 4,680,028, Cl. 604-74.000.

Stubinen Utveckling AB: *See—*
Skoog, Kurt, 4,679,512, Cl. 110-347.000.

Stutz, Anton: *See—*
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.

Stutz, Peter: *See—*
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.

Su, Sophia R.: *See—*
Onorato, Paulette I. K.; and Su, Sophia R., 4,680,049, Cl. 65-18.100.

Suda, Eriko: *See—*
Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.

Sudler, Roland, to VDO Adolf Schindling AG. Motor. 4,680,514, Cl. 318-318.000.

Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 4,679,931, Cl. 355-56.000.

Suematsu, Koshi; and Imai, Eiichi, to Canon Kabushiki Kaisha. Electrophotographic positively chargeable developer containing silica treated with a nitrogen containing silane coupling agent and method of developing. 4,680,245, Cl. 430-110.000.

Suetrak U.S.A., Inc.: *See—*
Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., 4,679,616, Cl. 165-43.000.

Sugai, Yoshiro; and Kimura, Hiroyuki, to Pioneer Electronic Corporation. Noise eliminating circuit. 4,680,793, Cl. 381-13.000.

Sugawa, Yoshihisa: *See—*
Matsumura, Masahiro; Ogasawara, Kenzi; Nakamoto, Atsuhiro; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.

Sugawara, Katsuyuki, to Alps Electric Co., Ltd. Disk supporting device. 4,680,655, Cl. 360-97.000.

Sugawara, Yasuyuki: *See—*
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.

Sugie, Akihiko: *See—*
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Sugiki, Tadashi, to Kabushiki Kaisha Toshiba. CCD area sensor with low signal level variation. 4,680,637, Cl. 358-213.260.

Sugimori, Shigeru: *See—*
Isoyama, Toyoshiro; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,680,137, Cl. 252-299.620.

Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, to Hitachi, Ltd. Multi-network system. 4,680,756, Cl. 370-88.000.

Sugimoto, Norihiko: *See—*
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.

Sugita, Yoshiji: *See—*
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Sugiyama, Kazuhiro; and Kawai, Yoshio, to Casio Computer Co., Ltd. Compact electronic device. 4,680,432, Cl. 200-5.00A.

Sugiyama, Kazuhiro; and Shimazaki, Tatsuo, to Casio Computer Co., Ltd. Sheet-like miniaturized electronic device. 4,680,724, Cl. 364-708.000.

Sugiyasu Industries Co., Ltd.: *See—*
Suzuki, Koichi, 4,679,660, Cl. 187-8.410.

Sugizaki, Iwao: *See—*
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.

Suiter, John R.: *See—*
Jacob, Neil R.; and Suiter, John R., 4,679,431, Cl. 73-290.00R.

Sukup, Richard A.: *See—*
Harris, Monty E.; and Sukup, Richard A., 4,679,624, Cl. 166-120.000.

Sulcabrush Inc.: *See—*
Florence, Max, 4,679,272, Cl. 15-106.000.

Sullivan, Mike: *See—*
Lubock, Paul; and Sullivan, Mike, 4,679,556, Cl. 128-303.00R.

Sultan, Steven L.: *See—*
Parnoff, George K.; and Sultan, Steven L., 4,679,573, Cl. 128-716.000.

Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, to Sony Corporation. Digital data recording and reproducing device. 4,680,763, Cl. 371-37.000.

Sumitomo Chemical Company, Limited: *See—*
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Yamada, Mikio; and Hamada, Akihiko, 4,679,794, Cl. 273-235.00R.

Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, to E. R. Squibb & Sons, Inc. O-sulfated spiro β-lactam hydroxamic acids. 4,680,388, Cl. 540-203.000.

Sundoro, Boby M., to Immunomedics, Inc. Bifunctional linker. 4,680,338, Cl. 525-54.100.

Sundstrand Corporation: *See—*
Baits, Stephen S.; and Reynolds, Richard W., 4,679,462, Cl. 74-687.000.
Bland, Timothy J., 4,679,980, Cl. 415-24.000.
Nelson, Jeffrey D.; and Scanlon, John F., 4,679,485, Cl. 89-36.020.

Sundstrand Data Control, Inc.: *See—*
Chisholm, John P., 4,680,587, Cl. 342-33.000.

Superior Surgical Mfg. Co., Inc.: *See—*
Belkin, Nathan L., 4,680,668, Cl. 361-220.000.

Sushardt, Rolf: *See—*
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,679,603, Cl. 141-39.000.

Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, to Nippon Kogaku K. K. Method of aligning a semiconductor substrate and a photomask. 4,679,942, Cl. 356-401.000.

Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, to Konishiroku Photo Industry Co., Ltd. Silver halide light-sensitive photographic material for radiographic use. 4,680,252, Cl. 430-364.000.

Suzuki, Akira, to Fuji Seiki Machine Works, Ltd. Method for preparation of silicon wafer. 4,679,359, Cl. 51-321.000.

Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Tone signal generation device for changing the tone color of a stored tone waveshape in an electronic musical instrument. 4,679,480, Cl. 84-1.220.

Suzuki, Koichi, to Sugiyasu Industries Co., Ltd. Mechanism for automatically storing swing arms used for apparatus for lifting automobiles for repair. 4,679,660, Cl. 187-8.410.

Suzuki, Masatoshi: *See—*
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.

Suzuki, Masayuki: *See—*
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.

Suzuki, Nobuyuki; and Shimizu, Masami, to Canon Kabushiki Kaisha. Motor driven film rewind device for camera. 4,679,926, Cl. 354-173.110.

Suzuki, Osamu: *See—*
Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuroh, 4,679,427, Cl. 73-54.000.

Suzuki, Shigeo: *See—*
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunske; Furuya, Tsuneo; and Baggen, Constant P. M. J., to Sony Corporation. Method and apparatus for transmitting digital data. 4,680,764, Cl. 371-40.000.

Suzuki, Takanori: *See—*
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.

Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, to Daikin Kogyo Co., Ltd. Aqueous coating composition of fluorocarbon resin. 4,680,331, Cl. 524-269.000.

Sverdlov, Evgeny D.: *See—*
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

Svitila, Barbara: *See—*
Magid, David J.; Svitila, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.

Swanson, Hilmer I., to Harris Corporation. RF splitter circuit. 4,680,559, Cl. 333-100.000.

Swartz, Robert G., to American Telephone and Telegraph Company, AT&T Bell Labs. Means for controlling a semiconductor device and communication system comprising the means. 4,680,810, Cl. 455-609.000.

Sweatman, Bobby. Chalk line marking device. 4,679,325, Cl. 33-138.000.

Sweeney, Christopher L.: *See*—
Wertz, Ronald D.; Orszulak, James H.; and Sweeney, Christopher L., 4,680,599, Cl. 340-744.000.

Swihart, William R.; and Deacon, Edwin R., to Garrett Corporation, The. Actuation system for variable nozzle turbine. 4,679,984, Cl. 415-163.000.

Syntex (U.S.A.) Inc.: *See*—
Nelson, Peter; and Unger, Stefan H., 4,680,300, Cl. 514-312.000.

Synthelabo: *See*—
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,680,296, Cl. 514-259.000.

Szluk, Nicholas J.; and Miller, Gayle W., to NCR Corporation. Formation of self-aligned stacked CMOS structures by lift-off. 4,679,299, Cl. 29-571.000.

Szporny, Laszlo : *See*—
Keve, Tibor; Zsadon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo ; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.

Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, to Nissan Motor Co., Ltd.; and Kinugawa Rubber Ind. Co. Ltd. Fluid-containing power unit mounting device. 4,679,778, Cl. 267-140.100.

Tabor, Jim: *See*—
Roszel, Lynn; and Tabor, Jim, 4,680,536, Cl. 323-321.000.

Tactile Perceptions, Inc.: *See*—
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.

Tada, Nobuhiko: *See*—
Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, 4,680,258, Cl. 435-7.000.

Taga, Jun, to Mitsui & Co., Ltd., a part interest. Pleated and sealed filter cartridge with connected film. 4,680,118, Cl. 210-493.100.

Taga, Yutaka: *See*—
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.

Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, to Fujitsu Limited. Semiconductor device. 4,680,600, Cl. 357-15.000.

Taisei Road Construction Co., Ltd.: *See*—
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

Tajima, Masayoshi: *See*—
Iwaki, Akihiro; and Tajima, Masayoshi, 4,680,680, Cl. 362-80.000.

Takahashi, Hisamitsu: *See*—
Yamaura, Tatsuo; and Takahashi, Hisamitsu, 4,680,231, Cl. 428-407.000.

Takahashi, Hisanori: *See*—
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.

Takahashi, Junichi: *See*—
Itoh, Yuji; and Takahashi, Junichi, 4,679,919, Cl. 351-206.000.

Takahashi, Satoji: *See*—
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.

Takahashi, Toshiro: *See*—
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.

Takahashi, Yasufumi: *See*—
Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, 4,680,556, Cl. 332-16.00R.

Takano, Nobuyoshi: *See*—
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.

Takano, Toshio: *See*—
Sakakiyama, Ryuzo; and Takano, Toshio, 4,680,712, Cl. 364-424.100.

Takara Co., Ltd.: *See*—
Ohno, Kouzin, 4,680,018, Cl. 446-376.000.

Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, to Tokyo Kogaku Kikai Kabushiki Kaisha. Automatic perimeter. 4,679,920, Cl. 351-226.000.

Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, to Hitachi, Ltd.; and Hitachi Medical Corporation. Input circuit in ultrasonic apparatus. 4,680,498, Cl. 310-319.000.

Takata, Kuniaki: *See*—
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.

Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information signal reproducing apparatus. 4,680,648, Cl. 360-10.200.

Takayanagi, Shinji: *See*—
Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, 4,679,860, Cl. 301-9.0DN.

Takeda Chemical Industries, Ltd.: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,680,390, Cl. 540-228.000.

Takeda Riken Kogyo Kabushikikaisha: *See*—
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.

Takeda, Yoshio, to Sharp Kabushiki Kaisha. Heat sensitive type adhesive connector. 4,680,226, Cl. 428-327.000.

Takegahara, Takashi: *See*—
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,680,719, Cl. 364-474.000.

Takemae, Yoshihiro: *See*—
Baba, Fumio; and Takemae, Yoshihiro, 4,680,734, Cl. 365-190.000.

Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, to Idemitsu Kosan Company Limited. Triazine derivatives, a process for preparing the derivatives, and herbicides containing the derivatives as the effective component. 4,680,054, Cl. 71-93.000.

Takemoto, Nagaaki: *See*—
Yamaguchi, Katsunori; and Takemoto, Nagaaki, 4,679,575, Cl. 131-365.000.

Takemoto, Tadashi: *See*—
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.

Takemura, Tetsuo; and Gohara, Shinobu, to Hitachi, Ltd. Time switch in a time division switching network. 4,680,752, Cl. 370-63.000.

Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, to Kabushiki Kaisha Toshiba; and Nippon Telegraph & Telephone Corporation. Thermal print head. 4,680,593, Cl. 346-76.0PH.

Takeuchi, Hiroshi: *See*—
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Takeuchi, Masaru: *See*—
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.

Takeya, Akira: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, to Sharp Kabushiki Kaisha. Apparatus for controlling a dewatering process. 4,679,414, Cl. 68-12.00R.

Takizawa, Hideaki: *See*—
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.

Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Height gauge. 4,679,326, Cl. 33-170.000.

Talmor, Shlomo S., to Harris Corporation. Stable current source. 4,680,535, Cl. 323-312.000.

Tam, Aloysius T., to Advanced Micro Devices, Inc. Memory with sequential mode. 4,680,738, Cl. 365-239.000.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.

Tamaki, Akihiro: *See*—
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.

Tamm, Ulf S. Apparatus for measuring pulse rate, vital capacity and pulmonary peak flow. 4,679,566, Cl. 128-671.000.

Tamura, Hifumi: *See*—
Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, 4,680,507, Cl. 315-111.810.

Tamura, Yasuji, to Sanden Corporation. Audio-frequency electromechanical vibrator. 4,680,492, Cl. 310-15.000.

Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, to Thomson-CSF. Tomodensitometry image acquisition and reconstruction process and a tomodensitometer using this process. 4,680,782, Cl. 378-4.000.

Tanabe, Hisaki: *See*—
Satoh, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotoshi, 4,680,348, Cl. 525-528.000.

Tanaka, Hideo: *See*—
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, 4,680,151, Cl. 264-40.300.

Tanaka, Hirokazu: *See*—
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsuo; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.

Tanaka, Kazuki: *See*—
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, 4,680,669, Cl. 361-230.000.

Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, to NEC Corporation; and Clarion Co., Ltd. Demodulator comprising an indicator circuit for use in common to cancellation of a pilot signal and an indication of a reception state. 4,680,792, Cl. 381-12.000.

Tanaka, Makoto: *See*—
Murayama, Sadamitsu; and Tanaka, Makoto, 4,680,221, Cl. 428-246.000.

Tanaka, Masaki; and Ichinohe, Shoji, to Shin-Etsu Chemical Co., Ltd. Fabric-finishing agent containing a novel organopolysiloxane. 4,680,366, Cl. 528-27.000.

Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, to Hokuetsu Industries Co., Ltd. Rotary machine having screw rotor assembly. 4,679,996, Cl. 418-201.000.

Tanaka, Minoru: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Tanaka, Shoji, to Fujitsu Limited. Printed circuit board laminating apparatus. 4,680,079, Cl. 156-353.000.

Tanaka, Yoshio; and Onodera, Toshihiro, to Kabushiki Kaisha Toshiba. Drive method for switching power converter and apparatus using this method. 4,680,534, Cl. 323-290.000.

Tanca, Michael C., to Combustion Engineering, Inc. Two stage slagging gasifier. 4,680,035, Cl. 48-77.000.

Taniguchi, Ikuo: *See*—
Ikeuchi, Satoshi; and Taniguchi, Ikuo, 4,680,776, Cl. 375-40.000.

Taniguchi, Shin: *See*—
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.

Tank, Klaus, to DeBeers Industrial Diamond Division (Propietary). Mining machine cutter pick insert. 4,679,858, Cl. 299-91.000.

Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., to Markland Specialty Engineering Ltd. Apparatus for detecting an interface in fluids utilizing plural multiplexed light emitters and receivers. 4,680,475, Cl. 250-577.000.

Tansony, Robert W.: *See*—
Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., 4,680,475, Cl. 250-577.000.

Tanttu, Jukka, to Instrumentarium Corp. NMR coil arrangement. 4,680,549, Cl. 324-318.000.

Taprogge Gesellschaft mbH: *See*—
Eimer, Klaus; and Gebhardt, Wolfgang, 4,680,113, Cl. 210-181.000.

Tarn-Pure Limited: *See*—
Hayes, John, 4,680,114, Cl. 210-192.000.

Tascon Medical Technology Corporation: *See*—
Alonso, Manuel T., 4,680,031, Cl. 623-2.000.

Task, Harry L.: *See*—
Genco, Louis V.; and Task, Harry L., 4,679,917, Cl. 351-221.000.

Tatami, Mitsushige, to Sony Corporation. Apparatus for correcting a time base error and for compensating dropouts included in a reproduced video signal. 4,680,658, Cl. 360-36.200.

Taunay, Claude, to Automobiles Peugeot; and Automobiles Citroen. Counterbalancing device for hatchback lid on a road vehicle. 4,679,841, Cl. 296-76.000.

Taverdet, Jean C., to Societe Xeram. Encapsulated housing for dissipating heat produced by electrical circuits. 4,680,673, Cl. 361-385.000.

Taylor, Clive N. Pipe connector. 4,679,825, Cl. 285-93.000.

Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., to Monsanto Company. Process for producing diperoxoic acids. 4,680,145, Cl. 260-502.00R.

Taylor, Maurice I., to Rolls-Royce plc. Gas turbine engine power plant. 4,679,394, Cl. 60-224.000.

Taylor, William E. G.: *See*—
Dunlop, Raymond B.; and Taylor, William E. G., 4,679,704, Cl. 222-56.000.

Te-Chin Handicraft Enterprise Co., Ltd.: *See*—
Gingline, Lin, 4,679,806, Cl. 280-47.380.

Teach, Ted L.: *See*—
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.

Tecumseh Products Company: *See*—
Guntly, Thomas G.; and Schultz, Curtis L., 4,679,534, Cl. 123-187.50R.

Teichmer, Daniel G.: *See*—
Murdock, Bruce; and Teichmer, Daniel G., 4,680,429, Cl. 178-19.000.

Teijin Limited: *See*—
Murayama, Sadamitsu; and Tanaka, Makoto, 4,680,221, Cl. 428-246.000.

Teissier, Claude: *See*—
Letournel, Michel; Helleboid, Jean-Marie; and Teissier, Claude, 4,680,496, Cl. 310-308.000.

Tektronix, Inc.: *See*—
Agoston, Agoston; and Sparkes, Robert G., 4,680,780, Cl. 375-120.000.
Baker, Daniel G.; and Ainsworth, Kenneth M., 4,680,620, Cl. 358-10.000.
Baker, Daniel G.; and Feisel, Magaret A., 4,680,621, Cl. 358-19.000.
Compton, Peter M., 4,680,557, Cl. 333-1.000.
Murdock, Bruce; and Teichmer, Daniel G., 4,680,429, Cl. 178-19.000.
Steinhart, Jonathan E., 4,680,729, Cl. 364-900.000.
Straayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., 4,680,577, Cl. 340-711.000.

Teldix GmbH: *See*—
Pawelek, Bernd-Christian, 4,680,715, Cl. 364-449.000.

Telecomunicacoes Brasileiras S/A - Telebras: *See*—
Ghosh, Subir; and Junior, Aluizio P., 4,680,558, Cl. 333-21.00R.

Teledyne Industries, Inc.: *See*—
Lamb, C. Paul, 4,679,592, Cl. 137-625.330.

Telefunken Fernseh und Rundfunk GmbH: *See*—
Goseberg, Walter; and Pollack, Alfred, 4,680,566, Cl. 336-181.000.

TeleMeter Corporation: *See*—
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., 4,680,704, Cl. 364-525.000.

Telesis Controls Corporation: *See*—
Robertson, John A., 4,680,457, Cl. 235-470.000.

Tempo Sanys: *See*—
Caumont, Jean-Francois, 4,679,278, Cl. 19-66.0CC.

Tennant Company: *See*—
Field, Bruce F.; and Kasper, Joseph G., 4,679,271, Cl. 15-49.00C.

Terauchi, Yasuo: *See*—
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.

Terra Tek, Inc.: *See*—
Johnson, Christopher F.; and Green, Sidney J., 4,679,441, Cl. 73-798.000.

Terrafix Limited: *See*—
Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, 4,680,590, Cl. 342-457.000.

Terrell, Paul J.: *See*—
Izumi, Hideki D.; and Terrell, Paul J., 4,680,731, Cl. 364-900.000.

Tesa S.A.: *See*—
Luthi, Walter, 4,679,332, Cl. 33-559.000.

Testa, Douglas: *See*—
Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, 4,680,175, Cl. 424-85.000.

Teubel, Johannes: *See*—
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.

Texas Instruments Incorporated: *See*—
Cochran, Michael J., 4,680,701, Cl. 364-200.000.
Fulton, Temple L.; and Perkins, William O., 4,680,753, Cl. 370-85.000.
Ott, Granville E., 4,680,579, Cl. 340-783.000.
Scott, Warner C., 4,680,805, Cl. 382-22.000.

Tharrington, G. Robert; and Hodge, Isabella A. Self-closing container top. 4,679,700, Cl. 220-337.000.

Theriault, Robert E.; and Hogeboom, John G., to Northern Telecom Limited. Double polysilicon integrated circuit process. 4,679,302, Cl. 29-571.000.

Therma-Wave, Inc.: *See*—
Rosencwaig, Allan; and Opsal, Jon, 4,679,946, Cl. 374-5.000.

Thevenot, Claude: *See*—
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.

Thibodeaux, Devron P.: *See*—
Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.

Thiele, Edith A. Restraining safety harness. 4,679,267, Cl. 5-494.000.

Thiersault, Jean P.: *See*—
Berrier, Bernard; and Thiersault, Jean P., 4,680,330, Cl. 524-230.000.

Thiessen, Hans-Henning: *See*—
Hornig, Klaus-Juergen; and Thiessen, Hans-Henning, 4,680,578, Cl. 340-731.000.

Thilwind, William: *See*—
Yoxon, Brian; and Thilwind, William, 4,680,206, Cl. 528-34.000.

Third Domain, Inc.: *See*—
Gerdes, Richard C.; and Vokac, Peter R., 4,680,633, Cl. 358-171.000.

Thomas & Betts Corporation: *See*—
Law, Joseph P., 4,679,827, Cl. 285-158.000.

Thomas, Gary E.: *See*—
Spierings, Gijsbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., 4,680,503, Cl. 313-480.000.

Thomas, Jacques B. Automatic ski tuning device. 4,679,356, Cl. 51-205.0WG.

Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jas.er W., to Motorola, Inc. Dry etching of multi-layer structures. 4,680,086, Cl. 156-643.000.

Thomason, Chris A.: *See*—
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.

Thomson-CGR: *See*—
Carron, Claude, 4,680,693, Cl. 363-98.000.

Thomson Components-Mostek Corp.: *See*—
Chan, Tsiu C.; and Han, Yu-Pin, 4,679,300, Cl. 29-571.000.

Thomson-CSF: *See*—
Berger, Jean L.; Brissot, Louis; and Cazaux, Yves, 4,680,476, Cl. 250-578.000.
Blanchard, Pierre; and Cortot, Jean P., 4,679,301, Cl. 29-571.000.
Boit, Jean C.; and Galves, Jean P., 4,680,461, Cl. 250-213.0VT.
Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, 4,680,782, Cl. 378-4.000.

Thorn, John E.; and Burns, William W., to Ford Motor Company. Fuel tank filler tube restrictor assembly. 4,679,698, Cl. 220-86.00R.

Thorp, Derek: *See*—
Kenyon, Ronald W.; and Thorp, Derek, 4,680,417, Cl. 549-299.000.

Thorsett, Eugene D.: *See*—
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,680,392, Cl. 540-527.000.

Thorson, Russell E.; and Marver, Douglas J., to Kimberly-Clark Corporation. Apparatus for controlling the heating of composite materials. 4,680,450, Cl. 219-388.000.

Thrall Car Manufacturing Company: *See*—
Blunden, Donald J., 4,679,974, Cl. 410-30.000.

Thurman, Richard E.: *See*—
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.

Tilsley, Gwilym J.: *See*—
Whinray, David T.; and Tilsley, Gwilym J., 4,680,723, Cl. 364-571.000.

Timex Corporation: *See*—
Sedlak, Adlof; and Stotz, Gerhard, 4,679,944, Cl. 368-157.000.

Titus, Frank. Cyclone filter with all metal filtering candle. 4,680,038, Cl. 55-302.000.

Tizzi, Valtiero. Method of manufacturing jewelry chains from decorated helicoid members and/or links. 4,679,391, Cl. 59-20.000.

Tokai Electric Wire Company Limited: *See*—
Saijo, Eiji; and Wakata, Shigekazu, 4,679,874, Cl. 439-595.000.

Tokiya, Yoshihiro: *See*—
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.
Toko, Inc.: *See*—
Mikami, Toshio; and Nagasawa, Yasuo, 4,680,528, Cl. 320-32.000.
Tokuhara, Mitsuhiro: *See*—
Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, 4,679,931, Cl. 355-56.000.
Tokui, Satoru: *See*—
Nanba, Keiichiro; Tokui, Satoru; and Onuma, Tatsuro, 4,680,634, Cl. 358-181.000.
Tokura, Isao: *See*—
Shimano, Noriyuki; Tokura, Isao; and Yamada, Mitsuhiko, 4,680,642, Cl. 358-280.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.
Tokuyama, Yoshio, to Victor Company of Japan, Ltd. Back-space editing control circuit for rotary-head magnetic tape recording and reproducing apparatus. 4,680,649, Cl. 360-14.200.
Tokyo Electric Co., Ltd.: *See*—
Iida, Yuji, 4,680,707, Cl. 364-405.000.
Yagi, Motoi; and Miyabayashi, Tadao, 4,680,631, Cl. 358-160.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, 4,679,920, Cl. 351-226.000.
Tokyo Shibaura Denki Kabushiki: *See*—
Ito, Takeshi, 4,680,652, Cl. 360-72.100.
Tomasi, Jean-Pierre, to U.S. Philips Corporation. Arrangement for determining the starting instant of the leading edge of a high-frequency pulse. 4,680,722, Cl. 364-569.000.
Tomatis, Stefano. Cheese hardening machine for pasta filata cheese. 4,679,497, Cl. 99-455.000.
Tomcufcik, Andrew S.: *See*—
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,680,293, Cl. 514-243.000.
Tominaga, Shigetake: *See*—
Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, 4,680,331, Cl. 524-269.000.
Tomisawa, Yutaka: *See*—
Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.
Tomitaka, Kichinojyo: *See*—
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojyo, 4,680,217, Cl. 428-141.000.
Tomkin, Frederick J. Retaining means. 4,679,276, Cl. 15-250.420.
Tomtec, N.V.: *See*—
Anthony, Jean M., 4,679,551, Cl. 128-67.000.
Tomy Kogyo Co. Inc.: *See*—
Hoshino, Shiro; and Fujino, Bonpei, 4,680,022, Cl. 446-487.000.
Tonon, Thomas: *See*—
Delahoy, Alan E.; and Tonon, Thomas, 4,680,616, Cl. 357-59.000.
Topfl, Werner: *See*—
Kristinsson, Haukur; and Topfl, Werner, 4,680,395, Cl. 544-321.000.
Torgny, Jan, to JATAB, Jan Torgny AB. Method and an invalid chair for conveying a person having limited ability to move without heavy lifting from a sitting to a lying position. 4,679,849, Cl. 297-330.000.
Torigoe, Masao: *See*—
Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, 4,679,990, Cl. 417-312.000.
Torii, Shuuji: *See*—
Ozaki, Kiyotaka; Torii, Shuuji; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.
Tosaka, Yoichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, 4,680,151, Cl. 264-40.300.
Tour & Andersson AB: *See*—
Petitjean, Robert; and Eriksson, Bo G., 4,679,729, Cl. 237-8.00R.
Towart, Robertson: *See*—
Wehinger, Egbert; and Towart, Robertson, 4,680,305, Cl. 514-347.000.
Town, Allen W. Waterproof glove. 4,679,257, Cl. 2-164.000.
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Blackmer, David E.; and Townsend, James H., Jr., 4,680,796, Cl. 381-23.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, to Fanuc Ltd. Zero-point return method. 4,680,520, Cl. 318-594.000.
Toyosawa, Yukio: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,680,518, Cl. 318-561.000.
Toyoshima, Shoji: *See*—
Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, 4,680,608, Cl. 357-36.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.
Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, 4,679,449, Cl. 74-12.000.
Uchida, Goroh, 4,679,730, Cl. 237-12.30R.
Trailigaz "Cie Generale de l'Ozone" : *See*—
Chapsal, Paul; and Petitimbert, Jean-Francois, 4,680,686, Cl. 363-10.000.
Tran-Gia, Phuoc: *See*—
Lehnert, Ralf; Tran-Gia, Phuoc; and Lempennau, Wolfram, 4,680,784, Cl. 379-11.000.
Tranbarger, Thomas P.: *See*—
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.
Trauth, Hubert: *See*—
Hettche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, 4,680,327, Cl. 524-110.000.
Trenchbond Limited: *See*—
Carrol, Alan, 4,680,112, Cl. 210-179.000.
Treptow, Leonard A. Audio aid for the blind. 4,680,740, Cl. 367-101.000.
Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Hydrazide containing derivatives of 2-amino-4-thiazole-acetic acid. 4,680,409, Cl. 548-194.000.
Trevathan, Larry C., to Nordson Corporation. Multi-orifice zero cavity nozzle dispenser. 4,679,711, Cl. 222-330.000.
Treybig, Duane S., to Dow Chemical Company, The. Thermosettable polystyrylpyrazine polymers terminated with ethylenically unsaturated groups and cured products therefrom. 4,680,347, Cl. 525-519.000.
Trieschmann, Christa: *See*—
Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, 4,680,365, Cl. 528-15.000.
Triner, Irvin R.; and Bixler, Craig A., to Molex Incorporated. Plug and receptacle connector assembly. 4,679,879, Cl. 439-425.000.
Triplett, James T.: *See*—
Campbell, Bruce D.; Triplett, James T.; and Tylor, Richard E., 4,679,907, Cl. 350-320.000.
TriStar Sports Inc.: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,679,814, Cl. 280-610.000.
Troeger, Gary L.: *See*—
Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., 4,679,298, Cl. 29-571.000.
Trumble, Francis R.: *See*—
Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., 4,680,591, Cl. 343-853.000.
Trump, Darryl D.: *See*—
Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., 4,679,934, Cl. 356-43.000.
Truninger, Paul. Apparatus for and method of loading elongated articles. 4,679,381, Cl. 53-447.000.
Truong, Long K.: *See*—
Beilin Solomon I.; and Truong, Long K., 4,680,103, Cl. 204-299.00R.
Trutzschler GmbH & Co. KG: *See*—
Kluttermann, Jurgen, 4,679,279, Cl. 19-159.00R.
TRW Inc.: *See*—
Helmink, Randolph C., 4,680,160, Cl. 419-6.000.
Ramsey, Wayne H., 4,679,875, Cl. 439-604.000.
Saunders, Chris H., 4,680,484, Cl. 307-448.000.
Tsai, Mon Y., to International Business Machines Corp. General linear shift register. 4,680,539, Cl. 324-73.00R.
Tsarev, Sergei A.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.
Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, to Contraves AG. Cell culture chamber with means for automatic replenishment of nutrient. 4,680,266, Cl. 435-284.000.
Tsubakimoto Chain Co.: *See*—
Minami, Hideaki, 4,679,977, Cl. 414-533.000.
Nakamura, Kenichiro, 4,679,451, Cl. 74-606.00R.
Tsuboi, Shinichi: *See*—
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.
Tsuchida, Naoki: *See*—
Aoi, Kazuo; and Tsuchida, Naoki, 4,679,532, Cl. 123-90.220.
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, to Canon Kabushiki Kaisha. Corona discharging apparatus. 4,680,669, Cl. 361-230.000.
Tsuge, Akihiko: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,680,278, Cl. 501-98.000.
Tsujimoto, Jun-ichi: *See*—
Miyamoto, Junichi; and Tsujimoto, Jun-ichi, 4,680,735, Cl. 365-210.000.

Tsujimura, Osamu; Hasegawa, Ryoei; and Ohkawa, Masayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Indexable cutter insert. 4,679,968, Cl. 407-114.000.
Tsukada, Mineharu: *See*—
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.
Tsukakoshi, Kunio: *See*—
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.
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Tsygankov, Jury D.: *See*—
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.
Tubman, Iosif. Pressure tester cap. 4,679,424, Cl. 73-45.800.
Tucker, Tillman J.: *See*—
Skogmo, Phillip J.; and Tucker, Tillman J., 4,680,434, Cl. 200-61.080.
Tunturipyora Oy: *See*—
Riikonen, Heikki, 4,679,816, Cl. 280-650.000.
Turner, Charles W.: *See*—
Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., 4,680,591, Cl. 343-853.000.
Turner, Norman L.; and Pollock, John D., to Varian Associates, Inc. Method and apparatus for improved ion dose accuracy. 4,680,474, Cl. 250-492.200.
Tylor, Richard E.: *See*—
Campbell, Bruce D.; Triplett, James T.; and Tylor, Richard E., 4,679,907, Cl. 350-320.000.
Ucci, Pompelio A.: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., 4,680,212, Cl. 428-97.000.
Uchida, Goroh, to Toyota Jidosha Kabushiki Kaisha. Heater for warming an operator of a vehicle. 4,679,730, Cl. 237-12.30R.
Uchida, Masahiro: *See*—
Hashimoto, Isao, Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.
Uchino, Megumi, to Hitachi, Ltd. Terminal control apparatus for parallel execution of data editing and data transmission/reception control. 4,680,699, Cl. 364-200.000.
Uchiyama, Susumu: *See*—
Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.
Udagawa, Etsuro: *See*—
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.
Ueda, Chie: *See*—
Ueda, Iwao, 4,680,111, Cl. 210-150.000.
Ueda, Iwao, to Ueda, Iwao; and Ueda, Chie. Sewage treatment equipment with activated sludge process beds. 4,680,111, Cl. 210-150.000.
Ueda, Masaki, to Fuji Photo Film Co., Ltd. Guide groove for a guard panel on a magnetic tape cassette. 4,680,660, Cl. 360-132.000.
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, to Nitto Boseki Co., Ltd. Process for producing poly(allylamine) derivatives. 4,680,360, Cl. 526-310.000.
Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, to Hitachi, Ltd. Liquid metal ion source. 4,680,507, Cl. 315-111.810.
Uesugi, Naoshi: *See*—
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.
Uhrey, Marc K., to Gould Inc. Quad-state control signal input circuit. 4,680,485, Cl. 307-463.000.
Uken, William D.: *See*—
Camin, Geary E.; and Uken, William D., 4,680,233, Cl. 428-424.600.
Uku, Kyouji; and Kato, Shinji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for preparation of droplets. 4,680,320, Cl. 523-313.000.
Ulrich, Helmut; Bartscher, Peter; and Shilton, Brian, to WABCO Westinghouse Fahrzeugbremsen GmbH. Relay valve device. 4,679,865, Cl. 303-52.000.
Ulvac Service Corporation: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
Umemoto, Hirotoshi: *See*—
Satoh, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotoshi, 4,680,348, Cl. 525-528.000.
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, to Hitachi, Ltd.; and Hitachi Medical Corporation. Piezoelectric ultrasonic transducer with acoustic matching plate. 4,680,499, Cl. 310-334.000.
Umino, Hiroshi: *See*—
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.
Unger, Stefan H.: *See*—
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Uniforms To You & Company: *See*—
Hischke, Marcia, 4,679,256, Cl. 2-105.000.
Union Carbide Corporation: *See*—
Koleske, Joseph V.; Smith, Donald F.; and Weber, Robert J., 4,680,361, Cl. 526-318.000.
Newman-Evans, Richard H., 4,680,341, Cl. 525-113.000.
Union Special Corporation: *See*—
Schwaab, Konstantin, 4,679,514, Cl. 112-235.000.
Unisearch Limited: *See*—
Cook, David J.; and Lim, Nam W., 4,680,059, Cl. 106-120.000.
UNISYS Corporation: *See*—
McNeal, Norman E.; and Nagy, Richard A., 4,680,075, Cl. 156-289.000.
United Kingdom Atomic Energy Authority: *See*—
Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., 4,679,430, Cl. 73-290.00V.
United States of America
Agriculture: *See*—
Biller, Cleveland J.; and Johnson, David D., 4,679,803, Cl. 280-6.00H.
Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.
Air Force: *See*—
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.
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Benke, George, 4,680,797, Cl. 381-41.000.
Bryant, Stephen M.; and Speir, Donald J., 4,680,589, Cl. 342-196.000.
Buck, Erik S., 4,680,500, Cl. 313-348.000.
Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., 4,679,934, Cl. 356-43.000.
Genco, Louis V.; and Task, Harry L., 4,679,917, Cl. 351-221.000.
Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,680,063, Cl. 148-11.50F.
Army: *See*—
Cavallaro, Paul V., 4,679,959, Cl. 403-143.000.
F'Geppert, Erwin, 4,679,459, Cl. 74-460.000.
Gerharz, Reinhold, 4,679,936, Cl. 356-128.000.
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Doss, James D., 4,679,561, Cl. 128-422.000.
Fasching, George E., 4,680,585, Cl. 340-870.130.
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Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., 4,679,422, Cl. 73-38.000.
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Newsom, Steven S.; and McCarthy, James M., 4,680,584, Cl. 340-850.000.
U.S. Philips Corporation: *See*—
Bailleul, Gilles; and Sannes, Tjerk, 4,679,317, Cl. 29-828.000.
Blanken, Pieter G.; and van der Zee, Pieter, 4,680,640, Cl. 358-243.000.
Clasen, Rolf; and Scholz, Heinz, 4,680,047, Cl. 65-17.000.
Dammann, Hans; and Kurz, Heinrich, 4,679,901, Cl. 350-162.200.
Field, Anthony J., 4,680,630, Cl. 358-160.000.
Haisma, Jan; van der Werf, Pieter; Robertson, John M., deceased; and de Haan, Freidrich J., administrator, 4,679,892, Cl. 350-96.120.
Lehnert, Ralf; Tran-Gia, Phuoc; and Lempennau, Wolfram, 4,680,784, Cl. 379-11.000.
Lohstroh, Jan; and Josquin, Wilhelmus J. M. J., 4,680,619, Cl. 357-86.000.
Loy, Fernand R., 4,679,912, Cl. 350-410.000.
Naudi, Alain, 4,680,716, Cl. 364-468.000.
Sijbers, Peter J. M.; Otten, Henricus J. M.; and Van Der Plaats, Petrie J., 4,680,789, Cl. 379-395.000.
Spierings, Gijsbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., 4,680,503, Cl. 313-480.000.
Tomasi, Jean-Pierre, 4,680,722, Cl. 364-569.000.
Veit, Ernst-Ludwig; and Klee, Jurgen, 4,679,723, Cl. 228-168.000.
Wrana, Josef B. V., 4,679,483, Cl. 89-1.5'0.
U.S. Product Development Company: *See*—
Adell, Robert, 4,679,290, Cl. 29-407.000.
United States Steel Corporation: *See*—
Grove, John A., 4,679,614, Cl. 164-436.000.
United Technologies Automotive, Inc.: *See*—
Douglas, William A., 4,680,316, Cl. 521-89.000.
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Jacaruso, Gary J., 4,680,216, Cl. 428-116.000.
Vontell, John H.; and Pike, Roscoe A., 4,680,199, Cl. 427-199.000.
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Porat, Itzchak; Grosberg, Percy; and Moghaddassi, Magid N., 4,679,784, Cl. 271-18.300.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See*—
Schieber, Hans; and Geitner, Otto, 4,679,412, Cl. 66-71.000.
University of California: *See*—
Smith, Tammy L., 4,680,272, Cl. 436-86.000.
University of Michigan, The: *See*—
Saha, Debabrata, 4,680,777, Cl. 375-53.000.

University of Rochester, The: *See—*
Jacobs, Stephen D.; and Cerqua, Kathleen A., 4,679,911, Cl. 350-347.00E.

Uoi, Michitake: *See—*
Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, 4,680,353, Cl. 526-160.000.

Upjohn Company, The: *See—*
Johnson, Brian S., 4,680,312, Cl. 514-573.000.
Nelson, Stephen J., 4,680,419, Cl. 549-343.000.

Urabe, Hiroshi: *See—*
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Uranit GmbH: *See—*
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Urata, Makoto: *See—*
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Urban Transportation Development Corporation Ltd.: *See—*
Smith, Roy E., 4,679,665, Cl. 188-218.0XL.

Usami, Nagatoshi: *See—*
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Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, 4,680,505, Cl. 313-558.000.

Usui, Akira: *See—*
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Utsumi, Shigeo: *See—*
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Utz, Eberhard: *See—*
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v. Rotberg, Bernhard: *See—*
Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, 4,679,820, Cl. 280-781.000.

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Van Doorne's Transmissie B. V.: *See—*
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Sakakiyama, Ryuzo, 4,679,674, Cl. 192-0.052.

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Vanderpool, James L.; and Bain, James M., to Monarch Marking Systems, Inc. Hand-held labeler having improved web position sensing and print head control. 4,680,078, Cl. 156-352.000.

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van der Zee, Pieter: *See—*
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Vandevoir, Claude: *See—*
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Van Kuren, Thomas A.: *See—*
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Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., to Raychem Corporation. Branch-off technique. 4,680,065, Cl. 156-49.000.

Van Santvoort, Gerardus P. T. M.: *See—*
Klugar, Karl; and Van Santvoort, Gerardus P. T. M., 4,679,731, Cl. 238-2.000.

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Varano, Richard F., to Sherwood Tool, Incorporated. Container forming apparatus having in-line blanker. 4,680,023, Cl. 493-75.000.

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Varwig, Juergen: *See—*
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Vasiliev, Vsevolod V.: *See—*
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Vaughan, Donald E.: *See—*
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VDO Adolf Schindling AG: *See—*
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Veber, Daniel F.; and Freidinger, Roger, to Merck & Co., Inc. Analogs of substance P and eledoisin. 4,680,283, Cl. 514-17.000.

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Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617.000.

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Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, 4,680,218, Cl. 428-195.000.

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Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

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Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.

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Witting, Karin; Poss, Dieter; and Schnabl, Rudolf, 4,680,438, Cl. 200-268.000.

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Cuisia, Dionisio G.; and Hwa, Chih M., 4,680,125, Cl. 210-697.000.

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Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, 4,680,340, Cl. 525-72.000.

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Ulrich, Helmut; Bartscher, Peter; and Shilton, Brian, 4,679,865, Cl. 303-52.000.

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Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

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Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, 4,680,365, Cl. 528-15.000.

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Wakerly, John F., to David Systems, Inc. Distributed clock synchronization in a digital data switching system. 4,680,779, Cl. 375-107.000.

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Waldeck, Gerald, to Electrohome Limited. Wide frequency range, switched band-oscillator. 4,680,555, Cl. 331-108.00D.

Wales, C. Ernest; and Peterson, Mitchell F., to Geosource, Inc. Method and apparatus for seismic exploration using non-linear sweeps. 4,680,741, Cl. 367-189.000.

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Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617.000.

Walker, Donald R.: *See*—
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Waller, David L.: *See*—
Edwards, Jonathan; Waller, David L.; and May, Michael D., 4,680,698, Cl. 364-200.000.

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Wang, Jish M.: *See*—
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Wang, Pen C., to Dow Chemical Company, The. Preparation of N- and S-1,2-ethylenically unsaturated organic compounds. 4,680,410, Cl. 548-231.000.

Ward, Irl E., to Environmental Management Associates, Inc. Stripping composition containing an amide and a carbonate and use thereof. 4,680,133, Cl. 252-153.000.

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Schumacher, Robert W.; and Houston, Mary B., 4,680,189, Cl. 426-285.000.

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Ambos, Hans D.; Cain, Michael E.; and Sobel, Burton E., 4,680,708, Cl. 364-417.000.

Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, to Fuji Heavy Industries Ltd.; and Nippon Air Brake Co., Ltd. Brake control apparatus for a vehicle. 4,679,668, Cl. 188-353.000.

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Watanabe, Kazuaki: *See*—
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Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, to Taisho Pharmaceutical Co., Ltd. Method for the treatment of systemic mycosis. 4,680,311, Cl. 514-561.000.

Watanabe, Naomitsu, to Hitachi, Ltd. Index type color picture tube. 4,680,502, Cl. 313-468.000.

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Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, 4,680,449, Cl. 219-385.000.

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Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.

Watanabe, Yoshiaki: *See*—
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.

Waters, Michael A., to Application Engineering Corporation. Passive mold cooling and heating system. 4,680,001, Cl. 425-144.000.

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Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., 4,679,430, Cl. 73-290.00V.

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Watson, Keith G.: *See*—
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Wean United Rolling Mills, Inc.: *See*—
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Lux, Horst; and Schatzler, Walter, 4,679,846, Cl. 296-214.000.

Weber, Robert J.: *See*—
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Wedco Inc.: *See*—
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Weed, Gregory C., to Du Pont de Nemours, E. I., and Company. Photopolymerizable composition containing carboxy benzotriazole. 4,680,249, Cl. 430-281.000.

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Wei, Ching-Yeu; and Pimbley, Joseph M., to General Electric Company. Graded extended drain concept for reduced hot electron effect. 4,680,603, Cl. 357-23.300.

Weiblen, Rolf-Diether. Heat-insulating window. 4,679,406, Cl. 62-262.000.

Weidenhaupt, Wolfgang; and Dismon, Peter, to AKZO NV. Reinforcing cord with wrapping wire. 4,679,387, Cl. 57-212.000.
Weightman, Barry O.; and Deane, Graham. Suction-irrigation equipment having a reciprocating valve. 4,680,026, Cl. 604-33.000.
Weinerman, Lee S.; and Vargus, Joel T., to Eastern Company, The. Half turn cabinet latch with three-part primary operating element. 4,679,835, Cl. 292-197.000.
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Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, to United States of America, Agriculture. Electrodynamic method for separating components of a mixture. 4,680,106, Cl. 209-1.000.
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Wernicke, Ubbo; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jurgen, to Agfa Gevaert Aktiengesellschaft. Regeneration of spent developers. 4,680,123, Cl. 210-683.000.
Wertz, Ronald D.; Orszulak, James H.; and Sweeney, Christopher L., to Ball Corporation. Cathode ray tube display system and method having bidirectional line scanning. 4,680,599, Cl. 340-744.000.
West, Neil L.: *See*—
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Western Company of North America, The: *See*—
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Prisco, Anthony J.; and Johnson, Alfred N., 4,679,738, Cl. 241-101.200.
Rieben, Stuart L.; and Wylie, Mark E., 4,679,377, Cl. 53-327.000.
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Westra Electronic GmbH: *See*—
Moser, Ludwig M.; and Kammermeier, Anton, 4,679,650, Cl. 181-130.000.
Wetzel, Robert E., to Dayco Products, Inc. Synchronous drive system and method of making the same. 4,679,999, Cl. 474-153.000.
Weyts, Johan J. M. E. Method for the fabrication of a double-walled construction element. 4,680,069, Cl. 156-197.000.
Wharfedale Loudspeaker Limited: *See*—
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Wheaton, Gregory A., to Pennwalt Corporation. Continuous preparation of dialkanesulfonyl peroxide. 4,680,095, Cl. 204-79.000.
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Whiteside, James D., II: *See*—
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Wickes Manufacturing Company: *See*—
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Wickman, John A., to American Tourister, Inc. Wheeled suitcase and handle. 4,679,670, Cl. 190-18.00A.
Wicks, Frank E. Efficient fuel utilization system. 4,680,478, Cl. 290-2.000.
Wicks, Jack W. Lift device for an incumbent person. 4,679,265, Cl. 5-445.000.
Wiegel, Hendrikus P. Protective shield for a welders mask. 4,679,254, Cl. 2-8.000.
Wilhelm Fette GmbH: *See*—
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Wilkinson, James H., to Sony Corporation. Decoding digital data. 4,680,766, Cl. 371-47.000.
Will, Karl-Heinz: *See*—
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Wm. R. Stewart & Sons (Hacklemakers) Limited: *See*—
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Williams, Charles F.; and Sahni, Atam P., to Ferro Corporation. Electrostatically conductive premold coating. 4,680,139, Cl. 252-511.000.
Williams, Janet C., to Dow Chemical Company, The. Branched polycarbonate composition from tris(hydroxyaryl)phosphorus compound. 4,680,370, Cl. 528-167.000.
Williams, John, to Interox Chemicals Limited. Process and apparatus for analysis. 4,680,271, Cl. 436-55.000.
Williams, Kenneth L. Concentricity gauge. 4,679,330, Cl. 33-550.000.
Williams, Tom R., to AMP Incorporated. Electrical terminal and a method of making it. 4,679,888, Cl. 439-883.000.
Willis, Donald H.; Fling, Russell T.; and Christopher, Todd J., to RCA Corporation. Television display system with flicker reduction processor having burst locked clock and skew correction. 4,680,632, Cl. 358-166.000.
Wilson, Charles G., to Golden Star, Inc. Method of making mops and mats impregnated with antimicrobial compounds. 4,679,859, Cl. 300-21.000.
Wilson, David A.: *See*—
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Wilson, Donna. Means for rendering controls tactually-sensitive. 4,679,342, Cl. 40-616.000.
Wilson, Jerry F., to Manville Sales Corporation. End closure lock. 4,679,725, Cl. 229-40.000.
Wilson, Jesse R.: *See*—
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Wilson, Robert K., to Allied Corporation. Reaction mechanism for tandem brake booster. 4,679,491, Cl. 91-369.00A.
Wilson, Robert M., Jr., to Dare Products, Inc. Electric fence insulator cap. 4,680,428, Cl. 174-158.00F.
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Witting, Karin; Poss, Dieter; and Schnabl, Rudolf, to W. C. Heraeus GmbH. Laminated material for electrical contacts and method of manufacturing same. 4,680,438, Cl. 200-268.000.
Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., to Hughes Aircraft Company. Payload depolyment from shuttle employing an ejection restraint device. 4,679,752, Cl. 244-158.00R.
Witzel, Homer D.: *See*—
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Wohrl, Bernhard; and Jabs, Alfred, to MT Motoren-und Turbinen Union Munchen GmbH. Heat exchangers having a tube matrix in a housing. 4,679,619, Cl. 165-81.000.
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., to Itek Corporation. Realtime digital diagnostic image processing system. 4,680,628, Cl. 358-111.000.
Wolber, Wolfgang, to Zumtobel Aktiengesellschaft. Bed reading lamp, particularly for hospital beds. 4,680,684, Cl. 362-223.000.
Wolf, Horst, to Zinser Textilmaschinen GmbH. Spinning or twisting machine. 4,679,389, Cl. 57-304.000.
Wolfe, Maynard F. Information devices. 4,679,822, Cl. 281-5.000.
Wolfe, Paul T.: *See*—
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Wolff, Harold E., to Dresser Industries, Inc. Soft seat Y-pattern check valve. 4,679,584, Cl. 137-269.000.
Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., to Chrysler Motors Corporation. Fastening arrangement for a convertible boot. 4,679,844, Cl. 296-136.000.
Woltersdorf, Otto W., Jr.: *See*—
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Wood, Charles F. Mounting for a wheelchair service tray. 4,679,756, Cl. 248-285.000.
Wood, Eric, to Insituform Group Limited. Lining of pipelines or passageways. 4,680,066, Cl. 156-156.000.
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Worms, Louis. Energy converter. 4,679,985, Cl. 416-119.000.
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Wrana, Josef B. V., to U.S. Philips Corporation. Dispenser and dispensing cassette. 4,679,483, Cl. 89-1.510.

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Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., to American Cyanamid Company. 3-imidazolylalkyl-, triazolylalkyl-, pyridinylalkyl-1,2,3-benzotriazin-4(3H)-ones and derivatives thereof. 4,680,293, Cl. 514-243.000.
Wright, William E., Sr.: *See*—
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Wroblewski, David J.: *See*—
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861.240.
Wunsche, Edgar R. Horizontal tapping furnace and method of operation. 4,679,773, Cl. 266-45.000.
Wylie, Mark E.: *See*—
Rieben, Stuart L.; and Wylie, Mark E., 4,679,377, Cl. 53-327.000.
Wyman, Richard E., to Canadian Hunter Exploration Ltd. Method of completing production wells for the recovery of gas from coal seams. 4,679,630, Cl. 166-305.100.
Wynn, Stephen R.: *See*—
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.
Xerox Corporation: *See*—
Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., 4,680,040, Cl. 55-387.000.
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., 4,680,332, Cl. 524-377.000.
Martin, Russel A.; and Buhler, Steven A., 4,680,605, Cl. 357-23.110.
Massie, Mark A.; and Rhodes, Christopher C., 4,679,928, Cl. 355-3.0DD.
Yacisin, Paul A., to Jennmar Corporation. Roof bolt apparatus with expansion shell and coupling. 4,679,966, Cl. 405-261.000.
Yacoe, J. Craig. Polyhedral structures that approximate a sphere. 4,679,361, Cl. 52-81.000.
Yagi, Katsumi, to Sanyo Electric Co., Ltd. Semiconductor laser with a quantum well layer including a disordered region. 4,680,768, Cl. 372-45.000.
Yagi, Motoi; and Miyabayashi, Tadao, to Tokyo Electric Co., Ltd. Television composite video signal processing circuit. 4,680,631, Cl. 358-160.000.
Yagi, Shinichi: *See*—
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Yagihara, Morio: *See*—
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Yakumo Industrial Corporation: *See*—
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Yamada, Akira: *See*—
Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.
Yamada, Kenji, to Nippon Kogaku K. K. Apparatus for eye examination. 4,679,921, Cl. 351-222.000.
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, to Ebara Corporation. Membrane separator. 4,680,109, Cl. 210-103.000.
Yamada, Mikio; and Hamada, Akihiko, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,679,794, Cl. 273-235.00R.
Yamada, Mitsuhiko: *See*—
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Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, to Kyocera Corporation. Magneto-optical recording element. 4,680,742, Cl. 369-13.000.
Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, to Fujikura Ltd. Heater for heating heat shrinkable tube. 4,680,449, Cl. 219-385.000.
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, to New Energy Development Organization; JGC Corporation; and Sanraku-Ocean Co., Ltd. Continuous alcohol manufacturing process using immobilized microorganism. 4,680,263, Cl. 435-162.000.
Yamada, Yasuyuki: *See*—
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Yamaguchi, Hideyo: *See*—
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Yamaguchi, Hiromasa: *See*—
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Yamaguchi, Kiyoshi: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamaichi Electric Mfg. Co., Ltd.: *See*—
Egawa, Yoshinori, 4,679,871, Cl. 439-70.000.
Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, to Kabushiki Kaisha Toshiba. Semiconductor pressure sensor. 4,680,569, Cl. 338-42.000.
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Yamamoto, Kazuo; and Asano, Shuichi, to NSK-Warner Kabushiki Kaisha. Seat belt apparatus. 4,679,821, Cl. 280-808.000.
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Yamamoto, Yoshio: *See*—
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Yamamuro, Sigeaki: *See*—
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Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, to Kanzaki Kokyukoki Mfg. Co., Ltd. Marine reversing clutch assembly. 4,679,673, Cl. 192-21.000.
Yamaoka, Masami: *See*—
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Yamashita, Hiroshi: *See*—
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Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, to Matsushita Electric Industrial Co., Ltd. Electric blower. 4,679,990, Cl. 417-312.000.
Yamaura, Tatsuo; and Takahashi, Hisamitsu, to Futaba Denshi Kogyo Kabushiki Kaisha. Low-velocity electron excited phosphor. 4,680,231, Cl. 428-407.000.
Yamazaki Machinery Works, Ltd.: *See*—
Momoi, Shoji; and Inami, Sumiaki, 4,679,286, Cl. 29-33.00P.
Yanagisawa, Masahiro, to Sanden Corporation. Porting member with a universal coupling mechanism. 4,679,829, Cl. 285-190.000.
Yang, Tai-Her. Force immune door latch. 4,679,420, Cl. 70-422.000.
Yano, Kazuhiko: *See*—
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Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, to Hitachi Metals, Ltd. Exhaust device having a heat-insulating layer comprising inorganic microballoons and a refractory layer and method of manufacturing same. 4,680,239, Cl. 428-688.000.
Yasuda, Yasushi: *See*—
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Yazaki, Mitsuhiro, to Kawasaki Jukogyo Kabushiki Kaisha. Liquid level detecting device. 4,680,575, Cl. 340-624.000.
Yoda, Norio: *See*—
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.
Yokogawa Hokushin Electric Corporation: *See*—
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Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, 4,680,466, Cl. 250-231.0SE.
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, to Nippon Foil Mfg. Co., Ltd. Composition for forming a layer of the supporting plate for use in lithography and process for producing the composition. 4,680,322, Cl. 523-416.000.
Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, to Oki Electric Industry Co., Ltd. CMOS data input-output circuit. 4,680,491, Cl. 307-579.000.
Yokoyama, Hiromitsu: *See*—
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Yokoyama, Yukio: *See*—
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Yokozawa, Norio: *See*—
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Yoshida Kogyo K. K.: *See*—
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Yoshida, Louis T.: *See*—
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Yoshida, Seiji: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.

Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, to Hitachi, Ltd.; and Kawasaki Steel Corporation. Cooling apparatus for belt type continuous casting machine. 4,679,611, Cl. 164-431.000.

Yoshida, Tomohiro: *See*—
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Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, to Matsushita Electric Industrial Co., Ltd. Heat pump apparatus. 4,679,403, Cl. 62-114.000.

Yoshigai Kikai Kinzoku Kabushiki Kaisha: *See*—
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Yoshigai, Toshiharu, to Yoshigai Kikai Kinzoku Kabushiki Kaisha. Brake lever device. 4,679,460, Cl. 74-489.000.

Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, to Kabushiki Kaisha Toshiba. Dot interpolation control system. 4,680,720, Cl. 364-521.000.

Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, to Fujitsu Limited. Coordinate detecting apparatus. 4,680,430, Cl. 178-19.000.

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Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, 4,679,449, Cl. 74-12.000.

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Yoshino, Teruo; and Itoh, Katsuro, to Kabushiki Kaisha Toshiba. Method and system for preventing an excessive voltage build-up in a power converter system. 4,680,691, Cl. 363-51.000.

Young, Paul R.; Koutek, Mary E.; and Kelly, John A., to Nalco Chemical Company. Polyacrylate scale inhibition. 4,680,124, Cl. 210-697.000.

Youngner, Daniel W.: *See*—
Finn, Chris J.; and Youngner, Daniel W., 4,679,308, Cl. 29-576.00B.

Yoxon, Brian; and Thilwind, William, to Pilkington Brothers P.L.C. Sealed double glazing unit. 4,680,206, Cl. 528-34.000.

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Yu, Wellington C.: *See*—
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Yuhara, Yukitomo; Okojima, Sumio; and Ishikawa, Tatsuo, to Yoshida Industry Co., Ltd. Vanity case. 4,679,576, Cl. 132-82.00R.

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Zarlengo, Dominic A.; and Zarlengo, Phillip C. Security bar for window opening. 4,679,351, Cl. 49-57.000.

Zarlengo, Phillip C.: *See*—
Zarlengo, Dominic A.; and Zarlengo, Phillip C., 4,679,351, Cl. 49-57.000.

Zawodni, Frank W., to Dana Corporation. Anchor pin retainer. 4,679,667, Cl. 188-341.000.

Zeaman, Robert E.; and Meyer, David E. Odometer for golf cart. 4,680,454, Cl. 235-95.00R.

Zeller, Christoph: *See*—
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Zemlicka, Alvin: *See*—
Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, 4,679,682, Cl. 192-21.000.

Zengo, Toshinari: *See*—
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Zenith Electronics Corporation: *See*—
Dietch, Leonard, 4,680,196, Cl. 427-68.000.

Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Ventilating device for a generator. 4,680,493, Cl. 310-62.000.

Zimmerman, William T.: *See*—
Levitt, George; and Zimmerman, William T., 4,680,053, Cl. 71-93.000.

Zimmermann, Marius: *See*—
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Zinser Textilmaschinen GmbH: *See*—
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Ziogas, Phoivos D.: *See*—
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ZLEHIT pri BAN: *See*—
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Zsadon, Bela: *See*—
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Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., to McDonnell Douglas Corporation. Method of fabrication of GaAs complementary enhancement mode junction field effect transistor. 4,679,298, Cl. 29-571.000.

Zumtobel Aktiengesellschaft: *See*—
Wolber, Wolfgang, 4,680,684, Cl. 362-223.000.

Zurcher, Josef: *See*—
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,679,586, Cl. 137-491.000.

Zwicker, Roger D., to Victor Equipment Company. Gas pressure reducing regulator. 4,679,582, Cl. 137-71.000.

Zybko, Walter C.; Wald, William; and McClure, Thomas V., to Burlington Industries, Inc. Self sticking carpet tiles. 4,680,209, Cl. 428-35.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzo N.V.: *See*—
Van Eenam, Donald N., Re. 32,459, Cl. 524-295.000.

DeLay, Victor A., Jr., to von dem Bussche, Carl; DeLay, Victor A., Jr.; and Maguire, Patrick T. Portable container with interlocking funnel. Re. 32,458, Cl. 220-86.00R.

Maguire, Patrick T.: *See*—
DeLay, Victor A., Jr., Re. 32,458, Cl. 220-86.00R.

Van Eenam, Donald N., to Akzo N.V. Viscosity modifiers for acrylamide polymers. Re. 32,459, Cl. 524-295.000.

von dem Bussche, Carl: *See*—
DeLay, Victor A., Jr., Re. 32,458, Cl. 220-86.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Feed mechanism for tobacco cutting machines. B1 4,369,797, 7-14-87, Cl. 131-109.300.

Bridgeford, Douglas J., to Teepak Investments, Inc. Humidifying and shirring artificial sausage casing. B1 4,062,981, 7-14-87, Cl. 426-278.000.

Chemische Werke Huls A.G.: *See*—
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.

Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, to Chemische Werke Huls A.G. Process for the manufacture of heat-stable, nuclear-brominated polystyrenes. B1 4,200,703, 7-14-87, Cl. 525-340.000.

Grundmann, Raban: *See*—
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.

IJR Inc.: *See*—
Inoue, Kiyoshi, B1 3,536,881, Cl. 219-69.00G.

Inoue, Kiyoshi, to IJR Inc. Constant current density EDM system capable of automatically responding to changing machining area. B1 3,536,881, 7-14-87, Cl. 219-69.00G.

Kimbell, Charles L. Gas detector. B1 3,464,799, 7-14-87, Cl. 422-91.000.

Maahs, Gunther: *See*—
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.

Micro Motion, Inc.: *See*—
Smith, James E., B1 4,422,338, Cl. 73-861.380.

O'Keefe, Thomas J., to University of Missouri, The Curators of the. Method for evaluating a system for electrodeposition of metals. B1 4,146,437, 7-14-87, Cl. 204-1.00T.

Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., B1 4,369,797, Cl. 131-109.300.

Smith, James E., to Micro Motion, Inc. Method and apparatus for mass flow measurement. B1 4,422,338, 7-14-87, Cl. 73-861.380.

Snaidr, Stanislav M.: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., B1 4,369,797, Cl. 131-109.300.

Tan, Khen-Sang, to Texas Instruments, Inc. On board self-calibration of analog-to-digital and digital-to-analog converters. B1 4,399,426, 7-14-87, Cl. 340-347.0CC.

Teepak Investments, Inc.: *See*—
Bridgeford, Douglas J., B1 4,062,981, Cl. 426-278.000.

Texas Instruments, Inc.: *See*—
Tan, Khen-Sang, B1 4,399,426, Cl. 340-347.0CC.

University of Missouri, The Curators of the: *See*—
O'Keefe, Thomas J., B1 4,146,437, Cl. 204-1.00T.

Wulf, Horst-Dieter: *See*—
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.

LIST OF DESIGN PATENTEES

Adachi, Koushirou: *See*—
Shibuya, Shinji; Adachi, Koushirou; and Morishita, Yasuji, 290,844, Cl. D14-109.000.

Adler, Janet F.: *See*—
Koester, Betty L.; and Adler, Janet F., 290,862, Cl. D21-173.000.

Appel, Mel, to Mel Appel Company, The. Crayon holder. 290,853, 7-14-87, Cl. D19-85.000.

Appel, Mel, to Mel Appel Company, The. Crayon holder. 290,854, 7-14-87, Cl. D19-85.000.

Arai, Isao: *See*—
Tomozawa, Hisashi; Ikeda, Hideyuki; Arai, Isao; and Saito, Shigeru, 290,818, Cl. D10-49.000.

Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, to Ghigini, Daniele. Automatic apparatus for measuring of arterial blood pressure. 290,876, 7-14-87, Cl. D24-21.000.

Babros, Ronald E.; and Cesaroni, William C., to Dart Industries Inc. Combined iron and base therefor. 290,898, 7-14-87, Cl. D32-68.000.

Badolato, Anthony; Corey, Edmund R., Jr.; and Barrera, James G., to McNeilab, Inc. Oxygenator for use in open heart. 290,875, 7-14-87, Cl. D24-8.000.

Balek, Lynn A. Auxiliary vehicle gas tank. 290,829, 7-14-87, Cl. D12-155.000.

Barrera, James G.: *See*—
Badolato, Anthony; Corey, Edmund R., Jr.; and Barrera, James G., 290,875, Cl. D24-8.000.

Becker, Robert B., to Helikon Furniture Co. Table. 290,796, 7-14-87, Cl. D6-480.000.

Berkley, Inc.: *See*—
Rumbaugh, James T., 290,868, Cl. D22-149.000.

Blanton, Joan. Portable urine specimen collector funnel. 290,880, 7-14-87, Cl. D24-54.000.

Blaylock, Keith W.: *See*—
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Brun, Serge, to Calor S.A. Electric iron. 290,899, 7-14-87, Cl. D32-70.000.

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Chasen, Lee R., to Coats & Clark, Inc. Combined food peeler and slicer. 290,804, 7-14-87, Cl. D7-147.000.

Chen, Jai-Ming. Telephone. 290,839, 7-14-87, Cl. D14-53.000.

Chen, Shang C. Ceiling fan. 290,873, 7-14-87, Cl. D23-158.000.

Chesnut, M. Gaines. Cartridge case. 290,866, 7-14-87, Cl. D22-108.000.
Chisholm, Dell T. Combination photographic frame and clock. 290,787, 7-14-87, Cl. D6-301.000.
Christ, Howard N. Sail. 290,834, 7-14-87, Cl. D12-317.000.
Clanton, W. Porter, to Quaker Oats Company, The. Toy tire and wheel assembly. 290,861, 7-14-87, Cl. D21-141.000.
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Cochran, E. Randall, to GTE Communication Systems. Housing for a desk telephone paystation base. 290,841, 7-14-87, Cl. D14-60.000.
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Grubel, Guy, 290,782, Cl. D2-320.000.
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Fenne, Kenneth R., to Pittway Corporation. Timer. 290,815, 7-14-87, Cl. D10-40.000.
Fenne, Kenneth R., to Pittway Corporation. Timer. 290,816, 7-14-87, Cl. D10-40.000.
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Kester, Melvin E., 290,792, Cl. D6-411.000.
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Forbes, Hampton E., Jr., to Westvaco Corporation. Blank for an octagonal tray. 290,813, 7-14-87, Cl. D9-433.000.
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Gardiner, Gail; and Gardiner, Arthur R. Combined balloon and candy centerpiece. 290,823, 7-14-87, Cl. D11-184.000.
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Giampapa, Vincent C.; and Peck, George C. Mid-facial maxilla skeletal implant. 290,878, 7-14-87, Cl. D24-33.000.
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Haas, Ulrich J., to Optyl Eyewear Fashion International Corp. Eyeglass frame. 290,848, 7-14-87, Cl. D16-119.000.
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Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 290,805, Cl. D7-351.000.
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Inada, Shinichi, to Toyota Jidosha Kabushiki Kaisha. Grille for an automobile. 290,830, 7-14-87, Cl. D12-163.000.
Inns, David H., to Glass Blubs Limited. Goblet or similar article. 290,799, 7-14-87, Cl. D7-13.000.
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Kester, Melvin E., to Fieldcrest Cannon, Inc. Modular display rack. 290,792, 7-14-87, Cl. D6-411.000.
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Koester, Betty L.; and Adler, Janet F. Boy clown rag doll. 290,862, 7-14-87, Cl. D21-173.000.
Kouno, Shuichi; Utsuki, Toshiyuki; Sakae, Hideki; and Watanabe, Kenichi, to Hitachi, Ltd. Electric fan. 290,872, 7-14-87, Cl. D23-155.000.
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Lange, Gerd, to Fixtures Manufacturing Corporation. Frame for a stack chair. 290,789, 7-14-87, Cl. D6-380.000.
Lester, Joan M. Game board. 290,856, 7-14-87, Cl. D21-25.000.
Linden, Erkki O., to Oy Fiskars AB. Kitchen scissors. 290,808, 7-14-87, Cl. D8-57.000.
Lohr, Raymond J. Combined magnetic spinner and trackway. 290,857, 7-14-87, Cl. D21-92.000.
Lovett, Robert H.; Kakuk, Jay J.; and Ellson, Bart T., to Toro Company, The. Multi-outlet center. 290,835, 7-14-87, Cl. D13-30.000.
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Mathies, Richard A.; and Mathies, JoAnne. Infant carrier. 290,825, 7-14-87, Cl. D12-129.000.
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Mayhugh, Mark A. Wind deflector for vehicles. 290,832, 7-14-87, Cl. D12-181.000.
McEntee, Martin J. Spring loaded flag. 290,822, 7-14-87, Cl. D11-166.000.
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Appel, Mel, 290,854, Cl. D19-85.000.
Meoli, Rudolph B.; and Blaylock, Keith W., to Kamp Industries, Inc. Tripod stand for a lantern or similar article. 290,886, 7-14-87, Cl. D26-138.000.
Miller, Karen L.; Turner, Linda L.; and Henderson, Erma L. Container for dispensing bags for bagging soiled diapers and the like. 290,810, 7-14-87, Cl. D9-318.000.
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Nagode, Larry R.; and Moomaw, David E., to Quaker Oats Company, The. Toy lawnmower. 290,859, 7-14-87, Cl. D21-124.000.
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Paul, Stanley M., 290,870, Cl. D23-25.000.
Paul, Stanley M., 290,871, Cl. D23-25.000.
Paul, Stanley M., to Paul Associates, Inc. Lavatory set. 290,869, 7-14-87, Cl. D23-25.000.
Paul, Stanley M., to Paul Associates, Inc. Lavatory set. 290,870, 7-14-87, Cl. D23-25.000.
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Petrossian, Christian. Caviar display unit. 290,800, 7-14-87, Cl. D7-22.000.
Petrossian, Christian. Caviar display unit. 290,801, 7-14-87, Cl. D7-22.000.
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Raftery, William B., to Steelcase, Inc. Design for a seat. 290,788, 7-14-87, Cl. D6-355.000.
Rittinge, Christer. Design for a corner piece for a base plate ventilation system. 290,881, 7-14-87, Cl. D25-55.000.
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Scheid, William J.; and Clayton, Bruce A., to Motorola, Inc. Portable two-way radio or similar article. 290,842, 7-14-87, Cl. D14-68.000.
Seiffert, Florian; and Yonezawa, Kazuyoshi, to Matsushita Electric Works, Ltd. Electric shaver. 290,887, 7-14-87, Cl. D28-49.000.
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Yubisui, Takahisa; Sakaguchi, Hiroshi; Iida, Katsuhiro; Shinohara, Megumi; and Saimen, Tadahiko, 290,845, Cl. D14-111.000.
Slany, Hans E. Combined floor scrubber and mop. 290,892, 7-14-87, Cl. D32-15.000.
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Raftery, William B., 290,788, Cl. D6-355.000.
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Streit, Kenneth F., to Geerpres, Inc. Bucket. 290,897, 7-14-87, Cl. D32-53.000.
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Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke GmbH. Steam iron. 290,891, 7-14-87, Cl. D32-70.000.
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Nakaseko, Kozaburo, 290,826, Cl. D12-147.000.
Nishimura, Takashi; and Kawakami, Masafumi, 290,828, Cl. D12-150.000.
Technicare, Corporation: *See*—
Wagner, Kenneth E., 290,874, Cl. D24-2.000.
Thomas, Joyce K.; and Hohulin, Samuel E., to National Union Electric Corporation. Battery powered suction broom. 290,895, 7-14-87, Cl. D32-22.000.
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Ueno, Koichi; Umehara, Nobuhiro; and Otaki, Osamu, 290,890, Cl. D32-70.000.
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Inada, Shinichi, 290,830, Cl. D12-163.000.
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Gubbe, Bernd; and Krause, Klaus D., 290,849, Cl. D18-1.000.
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Ueno, Koichi; Umehara, Nobuhiro; and Otaki, Osamu, 290,890, Cl. D32-70.000.
Usami, Satoru: *See*—
Sano, Koichiro; Usami, Satoru; and Okuno, Tadahide, 290,884, Cl. D26-65.000.
Utsuki, Toshiyuki: *See*—
Kouno, Shuichi; Utsuki, Toshiyuki; Sakae, Hideki; and Watanabe, Kenichi, 290,872, Cl. D23-155.000.
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Wendell R. Brooks, Inc.: *See*—
Yon, Jac H.; and Nemeth, Brad, 290,850, Cl. D18-23.000.
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Yon, Jac H.; and Nemeth, Brad, to Wendell R. Brooks, Inc. Computer printer stand. 290,850, 7-14-87, Cl. D18-23.000.
Yonezawa, Kazuyoshi: *See*—
Seiffert, Florian; and Yonezawa, Kazuyoshi, 290,887, Cl. D28-49.000.
Yoshida, Kenkichi, to Kabushiki Kaisha Buncho. Crayon. 290,851, 7-14-87, Cl. D19-41.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; Iida, Katsuhiro; Shinohara, Megumi; and Saimen, Tadahiko, to Sharp Corporation. Combined word processor-printer. 290,845, 7-14-87, Cl. D14-111.000.
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8 4,679,254
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49 C 4,679,271
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167 R 4,679,273
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236 R 4,679,275
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159 R 4,679,279

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233 4,679,280
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614 4,679,282

CLASS 26

73 4,679,283

CLASS 28

272 4,679,284

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116 AD 4,679,287
121.8 4,679,288
157 R 4,679,289
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576 B 4,679,307
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576 W 4,679,304
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CLASS 36

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CLASS 37

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CLASS 40

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CLASS 42

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341 R 4,680,039
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CLASS 56

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13.6 4,679,384
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263 4,679,388
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CLASS 59

20 4,679,391
35.1 4,679,392

CLASS 60

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55.5 4,679,401
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476 4,679,409
503 4,679,410
519 4,679,411

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346 4,680,051

CLASS 66

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125 R 4,679,413

CLASS 68

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45.8 4,679,424
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53 4,679,426
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61.1 C 4,679,428
61.4 4,679,439
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168 4,679,429
290 R 4,679,431
290 V 4,679,430
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304 C 4,679,433
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861.12 4,679,442
861.24 4,679,445
861.38 B1 4,422,338
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865.8 4,679,447
866.5 4,679,448

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458 4,679,458
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489 4,679,460
606 R 4,679,451
665 GA 4,679,461
687 4,679,462
711 4,679,463
752 A 4,679,450
752 D 4,679,456
788 4,679,464
805 4,679,465
863 4,679,466

CLASS 75

84.5 4,680,055

CLASS 79

840 4,679,318

CLASS 81

3.07 4,679,467
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470 4,679,469

CLASS 82

2.7 4,679,470
12 4,679,471
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CLASS 83

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171 4,679,474
420 4,679,475
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CLASS 84

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1.1 4,679,477
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309 4,679,481
467 4,679,482

CLASS 89

1.51 4,679,483
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36.02 4,679,485
126 4,679,486
140 4,679,487

CLASS 91

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189 R 4,679,490
369 A 4,679,491
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CLASS 98

38.6 4,679,494
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CLASS 99

450.2 4,679,496
455 4,679,497
483 4,679,498
591 4,679,499

CLASS 101

111 4,679,500
114 4,679,501
415.1 4,679,502

CLASS 102

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348 4,679,504
449 4,679,505

CLASS 105

136 4,679,506
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341 4,679,508

CLASS 106

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CLASS 108

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CLASS 110

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347 4,679,512

CLASS 112

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235 4,679,514
262.1 4,679,515

CLASS 114

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CLASS 116

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CLASS 118

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658 4,679,527

CLASS 122

367 C 4,679,528
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CLASS 123

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52 MB 4,679,531
90.22 4,679,532
179 F 4,679,533
187.5 R 4,679,534
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CLASS 125

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CLASS 126

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25 R 4,679,543
41 R 4,679,544
350 R 4,679,545

CLASS 128

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132 D 4,679,552
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764 4,679,572
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CLASS 131

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CLASS 132

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92 R 4,679,577

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853 4,679,596

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104 4,679,599
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CLASS 141

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19 4,679,602
39 4,679,603

CLASS 144

34 E 4,679,604
117 R 4,679,605
134 A 4,679,606
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CLASS 148

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11.5 F 4,680,063
111 4,680,062
617 4,680,064

CLASS 152

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CLASS 156

49 4,680,065
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165 4,680,067
196 4,680,068
197 4,680,069
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384 4,680,081
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626 4,680,084
643 4,680,085
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4,680,087

CLASS 160

107 4,679,610
124 4,679,609

CLASS 162

4 4,680,088
198 4,680,089

CLASS 164

431 4,679,611
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436 4,679,614
453 4,679,613

CLASS 165

1 4,679,615
43 4,679,616
56 4,679,617
71 4,679,618
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95 4,679,620
145 4,679,621
154 4,679,622
166 4,679,623

CLASS 166

120 4,679,624
248 4,679,626
249 4,679,627
252 4,679,628
270 4,679,625
281 4,679,629
305.1 4,679,630
307 4,679,631
345 4,679,632

CLASS 172

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250 4,679,634
260.5 4,679,635

CLASS 174

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42 4,680,424
50 4,680,425
57 4,680,426
88 R 4,680,427
158 F 4,680,428

CLASS 175

58 4,679,636
61 4,679,637
107 4,679,638
329 4,679,639
374 4,679,640

CLASS 177

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164 4,679,642
210 C 4,679,643

CLASS 178

19 4,680,429
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69 R 4,680,431

CLASS 180

6.5 4,679,644
65.8 4,679,645
165 4,679,646
219 4,679,647
272 4,679,648
291 4,679,649

CLASS 181

130 4,679,650
155 4,679,651

CLASS 182

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5 4,679,654
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42 4,679,656
113 4,679,657
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221 4,679,658

CLASS 184

15.2 4,679,659

CLASS 187

8.41 4,679,660
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82.1 4,679,663
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341 4,679,667
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CLASS 190

18 A 4,679,670
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CLASS 191

41 4,679,672

CLASS 192

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45 4,679,676
67 R 4,679,675
85 AA 4,679,677
85 R 4,679,680
89 B 4,679,683
106.2 4,679,678
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107 M 4,679,681

CLASS 194

350 4,679,684

CLASS 198

461 4,679,685
750 4,679,686
778 4,679,687

CLASS 200

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61.08 4,680,434
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84 R 4,680,437
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CLASS 202

187 4,680,090
205 4,680,091

CLASS 203

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CLASS 204

1 T B1 4,146,437
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164 4,680,096
180.1 4,680,097
182.4 4,680,098
213 4,680,099
228 4,680,100
295 4,680,101
299 R 4,680,102
4,680,103
300 R 4,680,104

CLASS 206

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334 4,679,689
345 4,679,690
557 4,679,691
581 4,679,692
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611 4,679,694

CLASS 208

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139.2 4,680,107
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295 4,679,697

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69 G B1 3,536,881
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121 ED 4,680,443
121 LG 4,680,442
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CLASS 222

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129.1 4,679,707
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CLASS 223

109 R 4,679,716

CLASS 224

42.06 4,679,717

CLASS 225

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4.5 4,679,724
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138 4,679,726

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95 R 4,680,454
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137.4 4,679,751
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129.04 4,679,766
129.15 4,679,767
159 4,679,768
282 4,679,769
328 4,679,770

CLASS 252

8.511 4,680,128
51.5 A 4,680,129
62.60 4,680,130
102 4,680,131
108 4,680,132
153 4,680,133
160 4,680,134
180 4,680,135
188.2 4,680,136
299.62 4,680,137
503 4,680,138
511 4,680,139
512 4,680,140
4,680,141
522 R 4,680,142
553 4,680,143

CLASS 254

273 4,679,771

CLASS 256

36 4,679,772

CLASS 260

501.15 4,680,144
502 R 4,680,145
505 R 4,680,146
513 R 4,680,147

CLASS 261

120 4,680,148

CLASS 264

2.1 4,680,149
26 4,680,150
40.3 4,680,151
40.4 4,680,152
40.5 4,680,158
44 4,680,153
63 4,680,154
73 4,680,155
171 4,680,156
180 4,680,157

CLASS 266

45 4,679,773
246 4,679,774

CLASS 267

64.27 4,679,775
140.1 4,679,776
4,679,777
4,679,778
4,679,779
177 4,679,780

CLASS 269

45 4,679,781
228 4,679,782

CLASS 270

54 4,679,783

CLASS 271

18.3 4,679,784
227 4,679,785

CLASS 272

70 4,679,786
93 4,679,787
4,679,788

CLASS 273

1 E 4,679,789
26 E 4,679,790
77 A 4,679,791
78 4,679,792
85 R 4,679,793
235 R 4,679,794
4,679,795
236 4,679,796
251 4,679,797
254 4,679,798
318 4,679,799

CLASS 277

34 4,679,800
53 4,679,801

CLASS 279

106 4,679,802

CLASS 280

6 H 4,679,803
30 4,679,804
33.99 A 4,679,818
33.99 R 4,679,805
47.38 4,679,806
65 4,679,807
91 4,679,808
4,679,809
166 4,679,810
284 4,679,811
406 A 4,679,812
602 4,679,813
610 4,679,814
618 4,679,815
650 4,679,816
655 4,679,817
680 4,679,819
781 4,679,820
808 4,679,821

CLASS 281

5 4,679,822
15 A 4,679,823

CLASS 285

27 4,679,824
93 4,679,825
149 4,679,826
158 4,679,827
175 4,679,828
190 4,679,829
323 4,679,830
332.2 4,679,831
414 4,679,832

CLASS 290

2 4,680,478

CLASS 292

113 4,679,833
169.13 4,679,834
197 4,679,835
216 4,679,836

CLASS 293

102 4,679,837
137 4,679,838

CLASS 294

119.4 4,679,839

CLASS 296

64 4,679,840
76 4,679,841
97 G 4,679,842
97 K 4,679,843
136 4,679,844
192 4,679,845
214 4,679,846
218 4,679,847

CLASS 297

284 4,679,848
330 4,679,849
410 4,679,850
452 4,679,851
464 4,679,852
468 4,679,853
486 4,679,854
4,679,855

CLASS 299

11 4,679,856
37 4,679,857
91 4,679,858

CLASS 300

21 4,679,859

CLASS 301

9 DN 4,679,860
37 P 4,679,861
112 4,679,862

CLASS 303

3 4,679,863
6 C 4,679,864
52 4,679,865
104 4,679,866

CLASS 307

265 4,680,479
270 4,680,480
279 4,680,481
4,680,482
355 4,680,483
448 4,680,484
463 4,680,485
475 4,680,486
4,680,487
482 4,680,488
493 4,680,489
575 4,680,490
579 4,680,491

CLASS 310

15 4,680,492
62 4,680,493
156 4,680,494
220 4,680,495
308 4,680,496
313 C 4,680,497
319 4,680,498
334 4,680,499

CLASS 312

287 4,679,867

CLASS 313

348 4,680,500
456 4,680,501
468 4,680,502
480 4,680,503
524 4,680,504
558 4,680,505

CLASS 315

102 4,680,506
111.81 4,680,507
166 4,680,508
290 4,680,509
368 4,680,510
411 4,680,511

CLASS 318

139 4,680,512
285 4,680,513
318 4,680,514
4,680,515
326 4,680,516
332 4,680,517
561 4,680,518
568 4,680,519
594 4,680,520
649 4,680,521
664 4,680,522
685 4,680,523
696 4,680,524
798 4,680,525
802 4,680,526

CLASS 320

2 4,680,527
32 4,680,528

CLASS 322

28 4,680,529
33 4,680,530

CLASS 323

206 4,680,531
240 4,680,532
4,680,533
290 4,680,534
312 4,680,535
321 4,680,536

CLASS 324

58 R 4,680,538
73 R 4,680,539
78 R 4,680,540
128 4,680,541
133 4,680,542
208 4,680,543
259 4,680,544
307 4,680,545
4,680,546
309 4,680,547
318 4,680,548
4,680,549
4,680,550
320 4,680,551
439 4,680,552
500 4,680,537

CLASS 330

2 4,680,553
260 4,680,554

CLASS 331
108 D 4,680,555

CLASS 332
16 R 4,680,556

CLASS 333
1 4,680,557
21 R 4,680,558
100 4,680,559
206 4,680,560
208 4,680,561

CLASS 335
16 4,680,562
4,680,564
58 4,680,563
216 4,680,565

CLASS 336
181 4,680,566

CLASS 337
164 4,680,567
186 4,680,568

CLASS 338
42 4,680,569
176 4,680,570

CLASS 340
52 R 4,680,571
347 CC B1 4,399,426
365 R 4,680,572
541 4,680,573
571 4,680,574
634 4,680,575
630 4,680,576
711 4,680,577
731 4,680,578
744 4,680,599
783 4,680,579
784 4,680,580
825.06 4,680,581
825.17 4,680,582
825.52 4,680,583
850 4,680,584
870.13 4,680,585
870.26 4,680,586

CLASS 342
33 4,680,587
92 4,680,588
196 4,680,589
457 4,680,590

CLASS 343
853 4,680,591

CLASS 346
1.1 4,680,592
75 4,680,696
76 PH 4,680,593
108 4,680,594
140 PD 4,680,596
140 R 4,680,595

CLASS 350
1.3 4,679,891
96.12 4,679,892
96.14 4,679,893
96.15 4,679,894
96.20 4,679,895
4,679,896
96.23 4,679,897
4,679,898
96.30 4,679,899
126 4,679,900
162.2 4,679,901
167 4,679,902
247 4,679,903
255 4,679,904
4,679,905
281 4,679,906
320 4,679,907
4,679,908
333 4,679,909
335 4,679,910
347 E 4,679,911
410 4,679,912
423 4,679,913
534 4,679,914
611 4,679,915
623 4,679,916

CLASS 351
163 4,679,918
206 4,679,919
221 4,679,917
222 4,679,921
226 4,679,920

CLASS 353
25 4,679,922
120 4,679,923

CLASS 354
3 4,679,924
173.1 4,679,925
173.11 4,679,926

CLASS 355
3 DD 4,679,928
3 R 4,679,927
4 4,679,929
52 4,679,930
56 4,679,931

CLASS 356
28 4,679,932
35 4,679,933
43 4,679,934
121 4,679,935
128 4,679,936
138 4,679,937
237 4,679,938
336 4,679,939
375 4,679,940
384 4,679,941
401 4,679,942

CLASS 357
15 4,680,600
4,680,601
17 4,680,602
23.11 4,680,605
23.3 4,680,603
23.4 4,680,604
26 4,680,606
30 4,680,607
36 4,680,608
42 4,680,609
50 4,680,614
55 4,680,615
59 4,680,616
68 4,680,610
71 4,680,611
4,680,612
72 4,680,613
4,680,617
74 4,680,618
86 4,680,619

CLASS 358
10 4,680,620
19 4,680,621
22 4,680,622
44 4,680,623
4,680,624
80 4,680,625
4,680,626
101 4,680,627
111 4,680,628
147 4,680,629
160 4,680,630
4,680,631
166 4,680,632
171 4,680,633
181 4,680,634
211 4,680,635
213.18 4,680,636
213.26 4,680,637
214 4,680,638
224 4,680,639
243 4,680,640
257 4,680,641
280 4,680,642
4,680,643
294 4,680,644
298 4,680,645
4,680,646
343 4,680,647

CLASS 360
10.2 4,680,648
14.2 4,680,649
33.1 4,680,650
36.2 4,680,658
38.1 4,680,651
72.1 4,680,652
72.2 4,680,653
96.3 4,680,659
96.5 4,680,654
97 4,680,655
98 4,680,656
111 4,680,657
132 4,680,660
133 4,680,661
4,680,662

CLASS 361
2 4,680,663
91 4,680,664
120 4,680,665
141 4,680,666
154 4,680,667
220 4,680,668
230 4,680,669
275 4,680,670
329 4,680,671
353 4,680,672
385 4,680,673
395 4,680,674
397 4,680,675
424 4,680,676

CLASS 362
33 4,680,677
61 4,680,678
4,680,679
80 4,680,680
98 4,680,681
158 4,680,682
190 4,680,683
223 4,680,684
240 4,680,685

CLASS 363
10 4,680,686
18 4,680,687
21 4,680,688
26 4,680,689
35 4,680,692
43 4,680,690
51 4,680,691
98 4,680,693
136 4,680,694
160 4,680,695

CLASS 364
171 4,680,697
200 4,680,698
4,680,699
4,680,700
4,680,701
4,680,702
4,680,703
300 4,680,705
405 4,680,707
414 4,680,709
417 4,680,708
419 4,680,710
424.1 4,680,711
4,680,712
426 4,680,713
4,680,714
436 4,680,717
449 4,680,715
455 4,680,718
468 4,680,716
474 4,680,719
492 4,680,706
521 4,680,720
525 4,680,704
565 4,680,721
569 4,680,722
571 4,680,723
708 4,680,724
709 4,680,725
721 4,680,726
754 4,680,727
900 4,680,728
4,680,729
4,680,730
4,680,731
4,680,732
4,680,733

CLASS 365
190 4,680,734
210 4,680,735
218 4,680,736
222 4,680,737
239 4,680,738

CLASS 367
90 4,680,739
101 4,680,740
189 4,680,741

CLASS 368
12 4,679,943
157 4,679,944
238 4,679,945

CLASS 369
13 4,680,742
44 4,680,743
4,680,744
45 4,680,745
50 4,680,746
65 4,680,747
77.1 4,680,748

CLASS 370
11 4,680,749
16 4,680,750
63 4,680,752
78 4,680,751
85 4,680,753
4,680,754
4,680,755
88 4,680,756
89 4,680,757
110.2 4,680,758
112 4,680,759

CLASS 371
21 4,680,760
25 4,680,761
28 4,680,762
37 4,680,763
40 4,680,764
42 4,680,765
47 4,680,766

CLASS 372
6 4,680,767
45 4,680,768
50 4,680,769
99 4,680,770
107 4,680,771

CLASS 374
5 4,679,946
42 4,679,947
129 4,679,948
183 4,679,949

CLASS 375
4 4,680,772
8 4,680,773
4,680,781
26 4,680,774
39 4,680,775
40 4,680,776
53 4,680,777
97 4,680,778
107 4,680,779
120 4,680,780

CLASS 376
272 4,680,159

CLASS 378
4 4,680,782

CLASS 379
6 4,680,783
11 4,680,784
57 4,680,785
60 4,680,786
63 4,680,787
93 4,680,788
395 4,680,789
432 4,680,790

CLASS 380
8 4,680,791

CLASS 381
12 4,680,792
13 4,680,793
15 4,680,794
4,680,795
23 4,680,796
41 4,680,797
68.4 4,680,798
68.6 4,680,799
194 4,680,800

CLASS 382
3 4,680,801
8 4,680,802
9 4,680,803
13 4,680,804
22 4,680,805
58 4,680,807
65 4,680,806

CLASS 383
9 4,680,808

CLASS 384
18 4,679,950

CLASS 400
110 4,679,951
279 4,679,952
625 4,679,953

CLASS 401
117 4,679,954

CLASS 402
4 4,679,955

CLASS 403
14 4,679,956
27 4,679,957
143 4,679,958
4,679,959
272 4,679,960
341 4,679,961

CLASS 404
126 4,679,962

CLASS 405
36 4,679,963
216 4,679,964
258 4,679,965
261 4,679,966
288 4,679,967

CLASS 407
114 4,679,968

CLASS 408
87 4,679,969
128 4,679,970
145 4,679,971
150 4,679,972

CLASS 409
200 4,679,973

CLASS 410
30 4,679,974

CLASS 411
443 4,679,975

CLASS 414
4 4,679,976
533 4,679,977
563 4,679,978
786 4,679,979

CLASS 415
24 4,679,980
116 4,679,981
145 4,679,982
152 A 4,679,983
163 4,679,984

CLASS 416
119 4,679,985

CLASS 417
53 4,679,986
54 4,679,987
218 4,679,988
238 4,679,989
312 4,679,990
360 4,679,991
364 4,679,992
490 4,679,993
525 4,679,994

CLASS 418
26 4,679,995
201 4,679,996

CLASS 419
3 4,680,161
6 4,680,160
21 4,680,162

CLASS 422
28 4,680,163
72 4,680,164
88 4,680,165
91 B1 3,464,799
159 4,680,166
199 4,680,167

CLASS 423
22 4,680,168
53 4,680,169
329 4,680,170

CLASS 424
5 4,680,171
47 4,680,173
85 4,680,174
4,680,175
89 4,680,176
101 4,680,177
122 4,680,178
449 4,680,172

CLASS 425
72 S 4,679,998
126 R 4,679,997
4,680,000
144 4,680,001
186 4,680,002
206 4,680,003

CLASS 426
15 4,680,179
16 4,680,180
36 4,680,181
62 4,680,182
64 4,680,183
83 4,680,185
129 4,680,186
4,680,187
278 B1 4,062,981
281 4,680,188
285 4,680,189
302 4,680,190
439 4,680,191
482 4,680,192
597 4,680,193
602 4,680,194
654 4,680,184

CLASS 427
44 4,680,195
68 4,680,196
129 4,680,197
164 4,680,198
199 4,680,199
213.34 4,680,200
230 4,680,201
389.9 4,680,202
393.6 4,680,203
407.1 4,680,204

CLASS 428
29 4,680,205
35 4,680,207
4,680,208
4,680,209
42 4,680,210
65 4,680,211
97 4,680,212
105 4,680,213
107 4,680,214
4,680,215
116 4,680,216
141 4,680,217
195 4,680,218
222 4,680,219
241 4,680,220
246 4,680,221
251 4,680,222
280 4,680,223
294 4,680,224
323 4,680,225
327 4,680,226
331 4,680,227
378 4,680,228
389 4,680,229
403 4,680,230
407 4,680,231
412 4,680,232
414.4 4,680,235
424.6 4,680,233
461 4,680,234
515 4,680,236
520 4,680,237
617 4,680,238
688 4,680,239

CLASS 429
13 4,680,240
49 4,680,241
136 4,680,242

CLASS 430
5 4,680,243
66 4,680,244
110 4,680,245
133 4,680,246
215 4,680,247
270 4,680,248
281 4,680,249
302 4,680,250
306 4,680,251
364 4,680,252
504 4,680,253
567 4,680,254
4,680,255
4,680,256
614 4,680,257

CLASS 431
5 4,680,004
46 4,680,005
265 4,680,006
344 4,680,007

CLASS 432
72 4,680,008
117 4,680,009
148 4,680,010

CLASS 433
29 4,680,011

CLASS 434
22 4,680,012
29 4,680,013
234 4,680,014
271 4,680,015

CLASS 435
7 4,680,258
11 4,680,259
68 4,680,260
4,680,261
4,680,262
162 4,680,263
172.3 4,680,264
4,680,265
284 4,680,266
289 4,680,267
291 4,680,268
301 4,680,269

CLASS 436
52 4,680,270
55 4,680,271
86 4,680,272
92 4,680,273
512 4,680,274
518 4,680,275
542 4,680,276

CLASS 439
61 4,679,872
70 4,679,871
78 4,679,869

CLASSIFICATION OF PATENTS

106 4,679,884
134 4,679,873
392 4,679,881
404 4,679,880
425 4,679,877
4,679,878
4,679,879
426 4,679,876
493 4,679,870
495 4,679,868
569 4,679,882
595 4,679,874
604 4,679,875
607 4,679,883
620 4,679,885
816 4,679,886
849 4,679,887
876 4,679,889
883 4,679,888
884 4,679,890

CLASS 440

66 4,680,017

CLASS 446

376 4,680,018
378 4,680,019
414 4,680,020
457 4,680,021
487 4,680,022

CLASS 455

601 4,680,809
609 4,680,810
617 4,680,811

CLASS 474

153 4,679,999

CLASS 493

75 4,680,023
159 4,680,016
197 4,680,024

CLASS 501

27 4,680,277
98 4,680,278
124 4,680,279

CLASS 502

66 4,680,280
218 4,680,281
304 4,680,282

CLASS 503

214 4,680,597
217 4,680,598

CLASS 514

17 4,680,283
18 4,680,284
23 4,680,285
4,680,286
42 4,680,287
63 4,680,288
172 4,680,289
182 4,680,290
183 4,680,291
210 4,680,292
243 4,680,293
256 4,680,294
258 4,680,295
259 4,680,296
293 4,680,297
4,680,298
311 4,680,299
312 4,680,300
321 4,680,301
327 4,680,302
336 4,680,303
340 4,680,304
347 4,680,305
389 4,680,306
460 4,680,307
492 4,680,308
499 4,680,309
539 4,680,310
561 4,680,311
573 4,680,312
627 4,680,313
725 4,680,314
738 4,680,315

CLASS 521

89 4,680,316
4,680,317
95 4,680,318
406 4,680,334

CLASS 523

210 4,680,319
313 4,680,320
335 4,680,321
416 4,680,322

CLASS 524

43 4,680,323
58 4,680,324
101 4,680,325
106 4,680,326
110 4,680,327
137 4,680,328
143 4,680,329
230 4,680,330
269 4,680,331
295 Re.32,459
377 4,680,332
394 4,680,333
501 4,680,335
548 4,680,336

CLASS 525

53 4,680,337
54.1 4,680,338
54.11 4,680,339
72 4,680,340
113 4,680,341
132 4,680,342
148 4,680,343
176 4,680,344
340 B1 4,200,703
437 4,680,345
486 4,680,346
519 4,680,347
528 4,680,348

CLASS 526

62 4,680,349
125 4,680,350
4,680,351
147 4,680,352
160 4,680,353
172 4,680,354
243 4,680,355
256 4,680,356
265 4,680,357
292.9 4,680,358
309 4,680,359
310 4,680,360
318 4,680,361
320 4,680,362

CLASS 528

14 4,680,363
15 4,680,364
4,680,365
27 4,680,366
34 4,680,206
44 4,680,367
49 4,680,368
76 4,680,369
167 4,680,370
179 4,680,371
4,680,372
185 4,680,373
204 4,680,374
253 4,680,375
279 4,680,376
322 4,680,377
4,680,378
336 4,680,379
485 4,680,380
501 4,680,381

CLASS 530

317 4,680,382
387 4,680,383

CLASS 534

622 4,680,384
695 4,680,385

CLASS 536

7.4 4,680,386

CLASS 540

136 4,680,387
203 4,680,388
222 4,680,389
228 4,680,390
355 4,680,391
527 4,680,392

CLASS 544

170 4,680,393
193 4,680,394
321 4,680,395
337 4,680,396

CLASS 546

51 4,680,397
121 4,680,398
139 4,680,399
141 4,680,400
153 4,680,401
235 4,680,402
247 4,680,403
269 4,680,404
270 4,680,405
345 4,680,406
348 4,680,407

CLASS 548

100 4,680,408
194 4,680,409
231 4,680,410
430 4,680,411
480 4,680,412
526 4,680,413
544 4,680,414

CLASS 549

214 4,680,415
292 4,680,416
299 4,680,417
305 4,680,418
343 4,680,419
476 4,680,420

CLASS 585

648 4,680,421

CLASS 604

6 4,680,025
33 4,680,026
68 4,680,027
74 4,680,028
280 4,680,029
391 4,680,030

CLASS 623

2 4,680,031

CLASSIFICATION OF DESIGNS

D2— 10 290,780
314 290,783
320 290,781
290,782
D3— 7 290,784
30.1 290,785
39 290,786
D6— 301 290,787
355 290,788
380 290,789
408 290,790
411 290,791
290,792
462 290,793
290,794
469 290,795
480 290,796
502 290,797
551 290,798
D7— 13 290,799
22 290,800
290,801
290,802
43 290,803
147 290,804
351 290,805
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